THE MYSTERIOUS KUNDALINI

SOME PRESS OPINIONS

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THE
MYSTERIOUS KUNDALINI

THE PHYSICAL BASIS OF THE "KUNDALI (HATHA) YOGA" IN TERMS OF WESTERN ANATOMY AND PHYSIOLOGY

BY
VASANT G. RELE
F C. P. S, L. M. & S.

FOREWORD
BY
SIR JOHN WOODROFFE, KT.
(ARTHUR AVALON)

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DEDICATED

TO

THOSE INTERESTED

IN

THE SCIENCE OF YOGA

OPINION

I have read this work of my old pupil Dr. Vasant G. Rele with the deepest interest. His views on the physiological explanation of the powers which the Yogis attain by their methods have much to be said for them and are of fascinating interest. The physiological facts and laws he quotes are truthfully and faithfully stated. The work has involved much study and thought and has been carried out with great ability.

C. H. L. MEYER, M. D. (London &c.)
LT.-COLONEL, I. M. S. (Retd.)
Late Professor of Physiology,
Grant Medical College, Bombay.

FOREWORD

The Tantras have a two-fold significance as Manuals of Sādhanā whether by way of worship (Upāsanā), or for extension of natural powers (Siddhi), or by way of Yôga to attain the Highest Worth (Paramārtha). In the Yoga aspect they are important because of their Hatha Praxis which seeks a development of man as a physical whole, as a propædeutic for Laya or Kundalini Yoga. In fact they are the repository of this particular type of Yoga. That such Yoga has been practised with some result I believe, not because I have personal experience in the matter but because it is an ancient Yoga and à priori it is not credible that men should continue to practise anything without attainment of any result. What may be its value is another question, a matter upon which I am not so sure as I once was. That this form of Yoga has a parapsychic interest is very clear. That it is, from what is called the "Spiritual" aspect, of equal value is not now so clear to me. That it may be dangerous is admitted by those who practise it. To me the Yogas of certain worth are those of Karma, Bhakti and Jnāna. There are, however, apparently some to whom Kundalinī Yoga makes special appeal, and who receive satisfaction therefrom. In any case the test is that of Ayurvéda, namely results. If I deal with this matter here it is because, on further consideration, I am disposed to think that I underrated in my "Serpent Power" the value of some adverse criticism of this Yoga which I, in the volume mentioned, quoted. However this be, Kundalinī Yoga is of

great scientific, parapsychic, and metaphysical interest and I am glad to provide an Introduction to the present conscientious and valuable enquiry. For, while the Yoga must be understood from its metaphysical and religious side, it has also a scientific aspect which must be dealt with by physiologists and others. I am very pleased therefore, that the author, a competent man of Science, has given to the subject the scientific attention which it has long required.

His view is an original one, namely that Kundalinī is the right Vagus Nerve. As to this I would say that Kundalinī Herself cannot be that and for this reason. She is the Grand Potential. As such She cannot, in my view, be identified with any of the products which She becomes. Kundalini, in my opinion is a gross form of Shakti. I say a gross form because, the Shaktis of the Lord are many such as His own Ananda Shakti and others. What in the Lord are Jnāna, Kriyā and Māyā Shakti, these are Sattva, Rajas and Tamas in the Pashu. Kundalinī Shakti in bodies is Prakriti Shakti, an evolute of the Lord's Māyā Shakti. From this latter and the Kanchukas come the Purusha and Prakriti Tattvas. Prakriti is the root Psycho-physical substance which evolves into the Tattvas from Buddhi to Prithivi which constitute the bodies of the Atman as Consciousness (Chit). She is then not as such, in my view, a nerve or any other physical substance or mental faculty but the Ground Substance of both which, on being roused, ascends and is merged in the higher Tattvas ending in Shiva-Shakti Tattvas when She is said to

be merged in Paramashiva. The Yoga is, in short, an evolutionary movement which is the reverse of the involution into matter which constitutes the Universe. Kundalinī is the Dynamic Real as the residual Power, the Power "left over" (to use a gross expression, for we can find no others) after the production of Prithivi when she coils herself around the Linga or Static Real and rests.

But if I am right in this, that is not to say that the Author's theory is without value. On the contrary it seems to me to have a worth which calls for examination, for assuming that Kundalinī is not to be identified with the Vagus Nerve it may yet well be that the Nerve has that function of practical importance in this Yoga which the Author claims to have discovered. It may not be only an important but, perhaps as he claims, the most important element in the actual Yogic working. Whether this be so or not I cannot say, for I am not a physiologist. It is for other scientific men to deal with the correctness of the Author's conclusion. All that I can and do now say is that (incompetent as I am to pass any scientific criticism upon the Author's work) it yet seems to me that he has made out a case for examination. But as to this I would premise that we must also deal with the Yoga Texts to some of which I have referred in my *Serpent Power*. It may be that some of the Texts have not been rightly understood, for there are differences of interpretation. I am glad then to know that a man of the scientific attainments of the Author has taken the matter in hand and has thus encouraged others to follow or to criticise him. If he

has made the discovery he claims, so much the better. In any case the point of present value is that he has carefully considered the subject and has offered us an argument in support of his conclusions. What we have to do in this or any other matter in the Shastras is to make *living* for us to-day the Scriptural Texts of the past. That there is more in them than some English educated Indians have supposed, is the conclusion at which I long ago arrived. Others besides myself will thank the Author for his devoted labour, the product of which I recommend to the judgment of the reader, Indian or other. From the friction of the mental Arani, the Fire of Knowledge is kindled.

OXFORD,
11th January 1927. } JOHN WOODROFFE

PREFACE

This book was at first a small paper read before the Bombay Medical Union in the month of July 1926. My initial aim was to explain some of the Yogic phenomena in terms of Western anatomy and physiology. The effort was greatly appreciated by those assembled, and a desire was expressed that I should have the paper printed for the benefit of those interested in the Science of Yoga. I felt impelled further to enlarge the scope of the paper by including explanations of many other Yogic phenomena and technical terms that were not dealt with in my original paper.

The reading of various manuals on the Kundali-Yoga, preparatory to writing this paper, convinced me that they are more or less treatises on the autonomic nervous system, and that these explain methods for establishing a conscious control over it. By the establishment of that control, an individual is said to gain supernatural powers by which he performs certain miracles.

The chief books used as the basis of this paper, are the three well-known Sanskrit texts with commentaries, viz. "Hatha–Yoga–pradīpikā," "Shiva-samhitā" and "Shat-chakra-nirupanam."

The explanations of the various Yogic practices and phenomena given by me are possible suggestions only, and

are to be taken as tentative till they are further developed by some one better versed in the Science of Yoga.

My sincere thanks are due to Mr. S. S. Mehta, B.A., for encouraging me to write this paper and for various valuable suggestions.

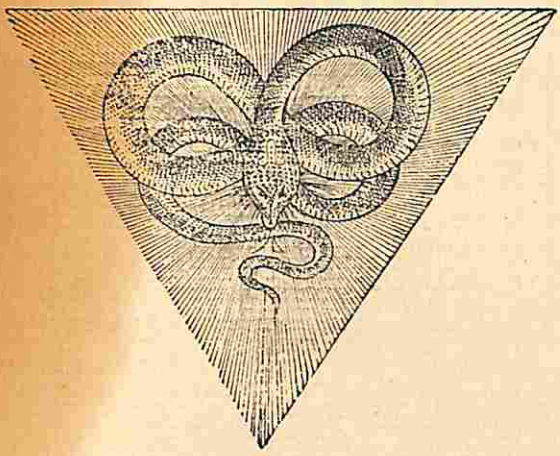
My thanks are also due to Swāmi Kuvalayānanda (Mr. J. G. Gune, B. A.) for supplying me with photos of Mudrās and Asanas for inclusion in this book.

Parekh Street,
Girgaum, Bombay,
India.
1st January 1927.

V. G. RELE

कंदोर्ध्वं कुंडली शक्तिः सुप्ता मोक्षाय योगिनाम्।
बंधनाय च मूढानां यस्तां वेत्ति स योगवित्॥

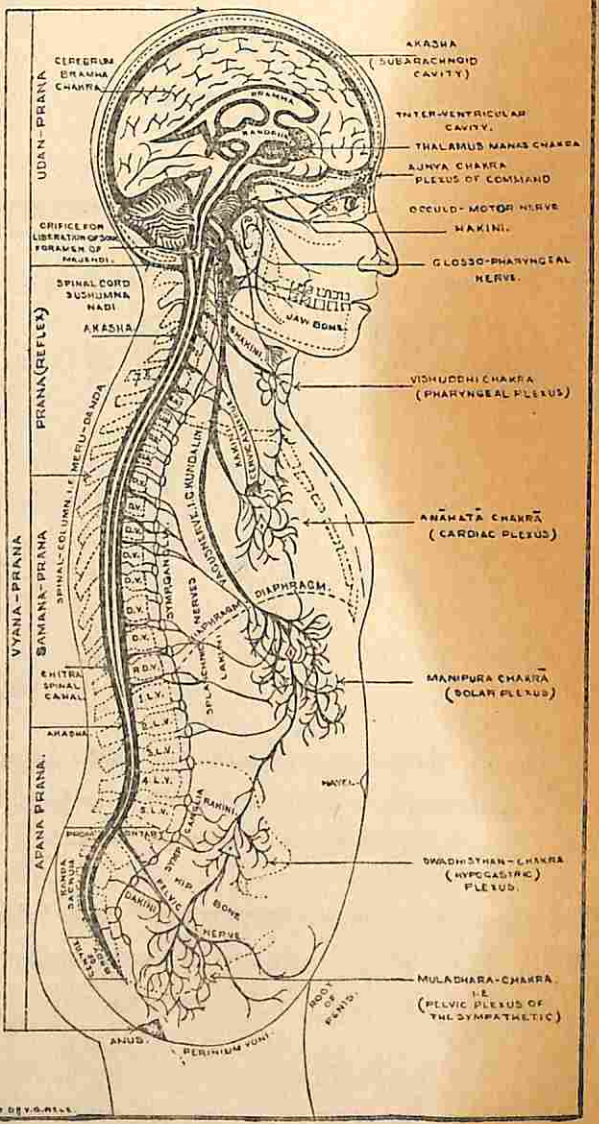
कुंडली कुटिलाकारा सर्पवत्परिकीर्तिता।
सा शक्तिश्चालिता येन स मुक्तो नात्र संशयः॥



The Kundalini is sleeping above the Kanda dispensing liberation to Yogis and bondage to fools. He who knows her knows Yoga.

The Kundalini, crooked in form, is described as being coiled like a Serpent. He who causes that Shakti to move is certain to be freed.

DIAGRAM OF THE AUTONOMIC NERVOUS SYSTEM ACCORDING TO THE WESTERN ANATOMY, SHOWING SIX PLEXUSES OF THE SYMPATHETIC, AND THE COURSE OF THE VAGUS NERVE



DESIGNED BY D.V.G.M.L.S.

THE MYSTERIOUS KUNDALINI

The Physical Basis of the Kundali (Hatha) Yoga in terms of Western Anatomy and Physiology.

Genesis of the Book.

Under the auspices of The Bombay Medical Union, a few days back Deshbandhu..... demonstrated certain phenomena, such as the stopping of the radial and the temporal pulse on both sides at will, and the stopping of the heartbeats for a few seconds. He also showed some rare feats of archery, such as the splitting of a hair and a thread by an arrow shot at them from a distance of 15 to 20 feet. He broke an iron chain three-eighths of an inch in thickness by a mere tug of his body at the chain fixed at the other end; one jerk, and crack went the chain in two pieces. "How was that done" was the expression that ran from mouth to mouth at the moment, and a good many present offered explanations to it, each in his own way. Some said it was due to muscle control; others said it was sheer hypnosis produced in a man who watched the pulse, while a few others

suggested nerve control. The gentleman performing these feats did it by Yogic science and Prānāyāma. We, as medical men, want to know the actual causation of these rare phenomena. I think, we, knowing as we do the anatomy and physiology of the body, ought to explain their cause, and yet it is a very difficult thing to explain. It may be that what is abnormal to men living on a lower plane of vibrations, is normal to those who live on a slightly higher plane of vibrations than ours. The muscles of the heart, artery and intestine may not be normally under our control, but they are made to act like voluntary muscles by certain methods and procedures which are followed so as to reach that higher plane of vibrations which is in tune with the Infinite.

Suggested Explanation.

I am here just suggesting an explanation of the different phenomena we observed that day. You must take the explanation for what it is worth. There may be other ways of explaining the phenomena, and perhaps better ones, and any one may come forward with such. Let us have some food for discussion for, discussion only will eventually lead us to the truth.

Digression.

Before I come to my explanation of these phenomena I shall have to digress somewhat into the realm of the Science of Yoga, without which the full significance of my explanation will not be understood; and I must ask your patience while I do so.

Physical development of Deshbandhu.

Let me first describe the physical development and appearance of this gentleman. He is of average height, slender in body, with a chest not broad enough to compare favourably with an athlete of average development; legs long and thin, and calf muscles showing insufficient physical exercise. In fact, there is nothing impressive about him. His voice too is not alluring or hypnotising; and yet he had the strength to break a chain by a mere tug of his body. This power of breaking a chain is supposed to be possessed by men of an athletic type, with a better muscular development than the best of us possess. But the physical development of Deshbandhu has given the lie direct to our supposition, and has proved to us that it is not the development of the muscles of our body that counts, but the power behind them. We call that power the power of endurance. I need not go deep into this, but one thing I may say, that while in the European method of physical culture more attention is paid to the graceful development of the muscles of the body, the Indian method of physical culture, on the other hand, aims at increasing the powers of endurance. This has been amply proved by the exploits of the Indian army in the recent War.

Feats of Deshbandhu.

I will now try to describe in detail the various feats performed by Deshbandhu, and also describe the condition of his body during those performances. When the performance was given before the Union the time was badly selected. It was late in the evening,

and one could not observe the different expressions on his face while he was undergoing the tests. I had seen him doing these very feats in broad day light, and had sat quite close to him observing and feeling the effects produced on his body by his various actions. When the show was given before the students of the.....Medical College and a few guests, myself and Dr.....were selected to judge the truth of his statements and told to report to the students what we actually saw and felt. Putting aside his various feats of archery, though wonderful enough in themselves, it is his feats in controlling the heart and pulse which are of importance to the medical world. I was observing his right radial pulse and Dr,.....his left. Deshbandhu was first told to stop his right pulse. When told to do so, he took a deep breath and made a forcible expiration and about five or six seconds later he asked me whether I felt the pulse. I replied that I could not feel the pulse. Immediately after his forced expiration his pulse had been very much accelerated for the first two or three seconds, there was then a slowing of the pulse for about two or three seconds, and then a complete stoppage. After one minute by the watch, he asked me again whether I felt the pulse. I had to answer "no". He told me to observe for another minute. Still it could not be felt. He said he would stop it for a minute longer, but, just as he uttered these words, I felt two or three beats and then again a stoppage. I informed him immediately of this, and he rejoined : "It does happen sometimes like that", and then he assured me that he could stop the pulse continuously for four minutes While I was observing the stoppage of pulse, I saw that his

hand and fingers were a little shaky and that his fingers were twitching. His hand was slightly livid but not cyanosed. During all this performance his other pulse was running normal as I ascertained from Dr.:.....and confirmed when he tried the same feat with the hand held by Dr.....A doubt was raised by the audience, and we were asked to see whether the muscles of his arms and forearms were contracted. On examining the muscles of his arms when he again stopped the pulse, we found that they were quite soft and pliable. I myself believe that no amount of muscular contraction can stop the pulse or circulation at a point; at the most the venous flow can be retarded, and that too only when the muscle is kept contracted for a long time.

Next, with the chestpieces of our stethoscopes over his heart, we listened to him stopping the beats of his heart. The process of deep breathing and forced expiration was repeated and, within a few seconds, we could hear the heart-beat flutter, slow down, and then completely stop. The duration of complete stoppage of the heart-beat was six seconds by the watch. When the beats recommenced, there was again an irregular fluttering of the heart, and then again the sounds became regular. The duration of these phenomena, from the first irregular beating of the heart preliminary to its stoppage right up to the recovery of complete regularity of the heart-beat, was 18 seconds. I mention this because of the fact that the period prior to the stoppage of the pulse and heart was six seconds. There appears to be a peculiar rhythm of six seconds in heart phenomena—preliminary acceleration six seconds; stoppage six seconds; and return to normal beat six seconds.

This has its significance of which I will speak later on. A diagramatic representation of the heart phenomenon is shown in the accompanying diagram.

The Condition of his heart.

According to the statement of Deshbandhu, he could, under favourable conditions stop the heart for 18 seconds—a multiple of six. We also watched him stopping the temporal pulse at will. Not being satisfied with what we saw and felt, we requested Deshbandhu to undergo a test under X-Rays and show the stoppage of his heart under it. He readily consented. Eight other medical men of repute, besides myself and Dr..... .....were present, and I can report that we actually saw the condition of the heart as I have described it. His heart was first examined under normal conditions and the point of its apex-beat was marked on the screen. He was then told to take deep breaths in and out, and again his apex-beat was marked on the screen. We found that, after each complete inspiration, his apex-beat was about half an inch internal to its normal position. Then he was told to stop the beating of the heart. His heart, thereupon, contracted and became smaller and smaller in size until when it reached the minimum limit its apex was about two-thirds of an inch internal

to its normal position and the apex-beat of the heart was inaudible, but the rhythmic contraction of the heart was still present. A cardiogram of his pulse and heart taken by Dr..... corroborated the facts mentioned above. The tracings of the cardiogram showed that, though the heart was inaudible, it had still a rhythmic flow of 60 beats per minute. This is probably the normal rhythm of the cardiac muscle itself and not of the heart with blood flowing through it, since the researches of Crile have proved that the muscles of the heart can be made to continue the rhythmic action even outside the body by perfusing them with a suitable fluid. The normal rhythm of the heart when the blood is flowing through it is 72 beats per minute. This is perhaps due to the pressure and composition of the blood acting on the fibres of the sympathetic nerves of the autonomic nervous system in the muscles of the heart,—this stimulation exciting and hastening the normal rhythm of the heart muscle.

I have, now, given the data in detail. The question before us is "How is this done?" Can we explain the various phenomena, so produced, by our present knowledge of physiology and anatomy?

Abnormality emphasised.

Let us first see whether previously made suggestions can be said to explain the various phenomena. I do not think anything of the explanation that there exists such a thing as independent control of the muscles; for to put the muscles in action, there must be some invisible excitation in the form of a

thought or some direct stimulus for the contraction of voluntary muscles. Even in those persons who are able to control the involuntary muscles, over which we have normally no control, the inhibitory and accelerating impulses must pass through the nerves. A second suggestion is that the organs of the involuntary muscles, as they are normally found in man, are perhaps in an abnormal case made up of voluntary muscles and thus the organs can be brought under the control of the central nervous system. But here the risk to life would be too great. The abnormal man so constituted could live or die and come to life again at his own sweet will. He could give rest to his heart at any moment by sending inhibitory impulses through the central nervous system and stop its movements altogether for some time, and cause it to become, so for as our knowledge goes, a dead weight, there being no rhythmicity in the voluntary muscular fibres. Would the man be alive then to send accelaratory impulses to that dead organ—an organ which carries nourishment through the blood to all parts of the body? Even the Yogis, who are far advanced in this science, cannot accomplish this, though they can make all the other organs of the body as well as the respiratory function inactive. The beating of the heart can never disappear completely because of the inherent rhythmicity of its muscular fibres. (The knowledge of this fact, perhaps, led the ancients to believe that the embodied Soul (Jīvātma) has his abode in the heart.) In fact, this rhythmic action of the heart, in the absence of all voluntary and involuntary movements, is the only continuing function that will bring them back to the material plane again

if they so desire, after, as they say, experiencing and gaining knowledge on the spiritual plane. We have heard stories in which Yogis have buried themselves for a required time extending over days and even months, when every function of the body is held in abeyance—even the most important function of respiration—and yet they too have to keep the pilot light, in the form of the rhythmic movement of the heart, burning to ignite the flame of life again as they are brought out of their place of burial.

A Kindred Abnormality.

The X-Rays exposition of the phenomena demonstrated that hypnotic suggestion is also out of question. The nerve-control theory is perhaps the only one which can explain them. But what nerves are controlled? The central nervous system has very little control over the involuntary muscular fibres such as the muscles of the heart, the intestine, the glandular organs, etc. These nerves are all out of the question. It is only a form of control over the sympathetic nervous system, over which we have normally no control, that can explain all the phenomena shown by Deshbandhu.

A Yogic Feat.

We are told by Deshbandhu that he is enabled to do all these feats by Yogic practice and Prānāyāma. This explanation of his, however, is Greek to us, till we are initiated into this Yogic science and connect it with our present knowledge of anatomy and physiology.

What is Yoga?

What, then, is Yoga, and what is Prānāyāma? If anything abnormal is done by a person, anything beyond the capacity of an ordinary individual, it is generally said to have been done by the Science of Yoga. Before we are initiated into the mystery of this Science of Yoga, it is as well to know what Yoga means. The word "Yoga" is derived from the root 'Yuja' to join or to weld together. Just as in welding, two pieces of the same metal are made to become one by the process of heating and hammering, so also in the Yoga of Indian Philosophy, the embodied spirit "Jivātma", which is part of the Universal Spirit "Paramātma", is made to become one with the Universal Spirit by certain physical and mental exercises. There are a good many ably written works on Yoga, both in the vernaculars and in English, and each has tried to define Yoga in its own particular way, and I will mention a few definitions. Some have defined Yoga as "self concentration with a view to seeing the soul as it looks when it is abstracted from mind and matter". Pātanjali describes Yoga as "suppression of thought." Here the word 'thought' must not be uuderstood in the usual narrower sense of reflection, but should be taken to mean conciousness which includes sensibility, imagination and dreams.

A simple definition of Yoga is found in the Bhagawad-Gitā where it is described as equanimity of mind in thought and deed, resulting in efficiency of action, done as service dedicated to God. But the definition most suited to us is that "Yoga is the science, which raises the capacity of the

human mind to respond to higher vibrations, and to perceive, catch and assimilate the infinite conscious movements going on around us in the universe." In fact it makes one a broadcasting as well as a receiving station of radio activity with the mind as the ærial. One can catch and receive the unspoken thoughts of others from any distance. One can also broadcast one's own thoughts to assist others in spiritual upliftment or guide them when they are in difficulty. It is claimed that all the miracles performed by the long line of saints, saviours and sages of all times and in all climes, were due to the knowledge of this, the grandest of all sciences. From the definition given above, we can see that Yoga means "the union or the linking together of man with God; or, more correctly, the disunion or separation of man from objects of sense, i. e. from the phenomenal world. It is the science which leads the initiate by easy gradations to the loftiest height of Self-realisation till he stands face to face with the object of his search." This object of his search can be obtained by a variety of ways, either by dedicating all the fruits of work to God—and this way is called Karma-Yoga—or by absolute surrender of all our hopes and aspirations including the self also to God, in the belief that His grace is our highest good. This is called Bhakti-Yoga. The highest form of Yoga is Jnāna-Yoga in which the soul does not see itself except as infilled by and made identical with the Absolute God. This is enough for our purpose. I need not go deeper into the mysteries of Yoga, but say a few words regarding its achievement.

Patanjali, the venerable codifier of this science of Rāja-Yoga, who flourished in the 2nd century B. C., has given eight steps. These are arranged in gradation, each one more difficult to master than the previous one.

Eight steps of Yoga.

They are :–Yama, Niyama, Asana, Prānāyāma, Pratyāhāra, Dhāranā, Dhyāna and Samādhi. I must explain the meaning of these Sanskrit terms and what they include as given in the Pātanjali Yoga-sūtras, *i. e.* The Aphorisms of Patanjali on Yoga (Rāja-Yoga).

" Yama " signifies truthfulness, non-stealing, continence, and not receiving of gifts. This first step, though it looks simple, is not possible to practice to the letter.

Yama.

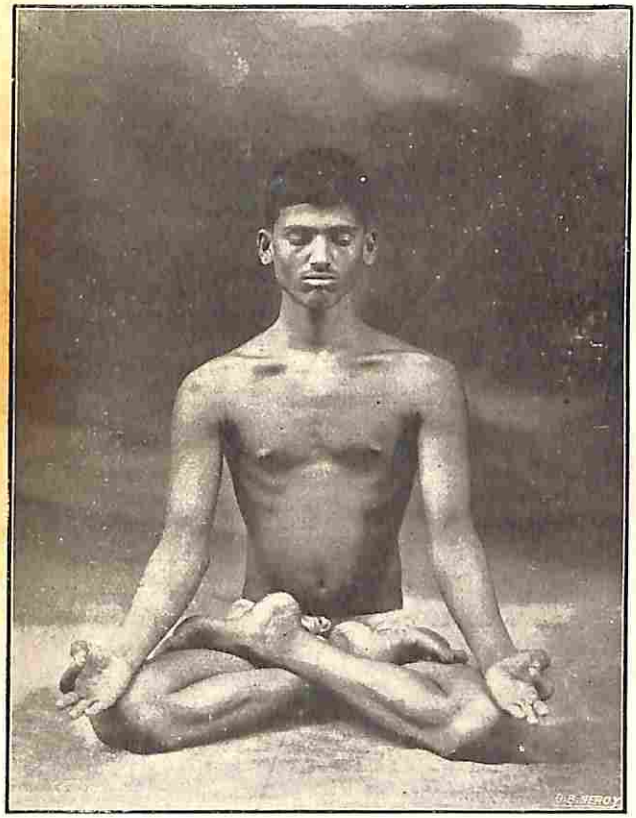
" Niyama " means cleanliness both external and internal, contentment, study, and adoration of God.

Niyama.

The third step is that of " Asana," that is a posture for contemplation. A posture is necessary to keep the body motionless, lest its unchecked restlessness should disturb the mind and dissipate the energy of the will. It has been shown by experience that the best Asana is Padmāsana *i. e*, a sitting posture with the legs crossed after the manner of the image of Buddha but slightly varied. In this Asana, the left foot is placed on the right thigh and the right foot on the left thigh ; the right hand catches hold of the right toe and the left hand catches hold of the left toe and the gaze is

Asana.

Plate I.



PADMASANA.

(Vide page 12)

directed on to the tip of the nose. This is called the pose of composure, and is helpful in keeping the mind steady. The first two steps mean a moral training of the soul, while the third step is more for the training of the muscles of the body. I may mention here that there are in all 84 Asanas or postures mentioned, and each has a seperate name. I will not trouble you with the enumeration of these. Each Asana is supposed to control certain muscles and nerves of the body. They are also useful as therapeutic measures for certain diseases, and more particularly, for certain chronic diseases associated with the nerves and metabolism. Nay, practisers go still further and aver that diseases like leprosy and epilepsy can be cured by a postural method called Sarvānga-sādhana which is said to have a soothing influence on the nervous system.

Prānāyāma.

When the Asana becomes habitual and is no longer a source of distraction to the mind, Prānāyāma, the fourth step, may be practised with ease. We had heard this word uttered many a time before we observed and tested the feats of Deshbandhu. Very few, perhaps, know the real meaning and full significance of the word Prānāyāma. The real object of Prānāyāma is to control the nerves or nerve centres which cause the muscles of respiration alternately to relax and contract automatically. Breath has very little to do with it, though breathing is one of the means of bringing under control the Prāna *i. e.* energy or nervous impulse. We know that the respiratory act is under the

control of the Vagus nerve, which has two sets of fibres afferent and efferent; stimulation of the first stops expiration and produces inspiration; and stimulation of the second does the reverse. These fibres are excited to action by the alternate contraction and distension of the air vesicles where the Vagus terminations are situated. Prānāyāma, then, is really a process of bringing under control the Vagus nerve, over which we have, normally, no control. We can understand the importance of this control when we know that all the vital forces are more or less under the control of the Vagus nerve and its centre; and when this is achieved by Yoga, there is said to be nothing in nature that cannot be brought under the control of the performer. All the forces of nature will obey him as his slaves, and, when the ignorant see these powers of the Yogi, they call them miracles.

Prānāyāma further explained.

Prānāyāma, then, really signifies the controlling of energy *i. e.* the nervous impulse of the autonomic system and the numerous activities of the body caused by them, so as to prevent their dissipation in all directions, and the directing of them in a particular channel at will, as was done by Deshbandhu in stopping the pulse of a particular arm. In its fullest significance, it means the controlling of cosmic energy, that is, life itself.

Popularly, Prānāyāma is generally taken to mean the regulation of breath, and the importance of this regulation of breath can be seen when it is said that a Yogi measures his span of life not by a number of years, but by a number of

breaths. Dissipated breathing brings early death, while its regulation prolongs life.

Regulation & Control of Breath.

I must enter into the details of this fourth step *viz.*, Prānāyāma, because it is said to be the first stumbling block to the attainment of Yoga, while the subsequent steps are easy to attain, if one can achieve mastery over the process of Prānāyāma. Besides that, breathing is the chief method of absorbing energy from the atmosphere; or it may be put that the lungs are the store-house of an absorbed atmospheric energy and that they impart it to the rest of the organs. In fact, what the fly-wheel is to machinery, the lungs are to the body. With each breath we inhale a certain amount of electricity or energy from the atmospheric air. This energy is absorbed by the blood and transferred to the nerves of involuntary motion. I have advisedly used the world "involuntary". Ordinarily, respiration is an involuntary act, though it can be made voluntary, when we desire to speak, laugh or cry. To gain control, one should begin by correcting the normal breathing. To do this, one should first of all be conscious of one's breathing. Consciousness of one's breathing forces one to take deeper breaths and makes one absorb larger quantities of atmospheric energy, which are employed to energise the nervous system; but to do this, breathing must be of the Yogic character.

Classification of Breathing.

We can classify respiration in four types *viz.*, High-breathing, Mid-breathing, Low-breathing and Yogic-breathing. High-breathing is what we know as clavicular or collarbone breathing. In this breathing only the upper part of the chest and lungs, which is the smallest part, is used, and consequently, a minimum amount of air enters the lungs. In addition to this, the diaphragm, a partition separating the thoracic from the abdominal cavity, being raised, it compresses the lowermost portion of the lungs and thus no expansion of the lungs occurs downwards. In this breathing, there is a maximum amount of effort made to obtain a minimum amount of benefit.

Mid-breathing, to which we are normally accustomed, is what we call intercostal or thoracic breathing. It is less objectionable than high breathing, but inferior to low-breathing.

Low-breathing, or diaphragmatic breathing, is far better than the two previously mentioned forms of breathing. Western writers have now come to learn the importance of this breathing and have largely extolled its merits in their Health magazines. In this breathing the movement of the diaphragm plays a very important part. The diaphragm when at rest presents a concave surface to the abdominal cavity and is protruded in the chest like a cone. When it is brought into use, the conical appearance disappears and the diaphragm presses on the abdominal contents and forces the abdomen out. This breathing fills the lower and middle parts only. In Yogic practice, this breathing also has no place.

In Yoga, breathing includes all the three modes.

Yoga-breathing.

The process for this breathing is as follows :—The upper part of the lungs is first filled with air; then, by expanding the ribs an additional volume of air is further inhaled to fill up the middle portion of the lungs; again, by protruding the abdomen or by allowing the diaphragm to lie flat, still more air is drawn in to fill the lowest part of the lungs. Thus, in Yogic-breathing, the whole of the lungs from apex to base is filled with air at each inspiration so as to absorb the maximum quantity of oxygen and store up the maximum amount of Prāna.

Training of the will

After one has thus learnt to expand the lungs to their fullest capacity, the next step is to bring a rhythm into the respiration. This rhythm bears a fixed ratio to inhalation and retention of breath and again to retention of breath and exhalation; and when a complete mastery over this rhythm and full expansion of the lungs is obtained, Prāna or energy may be willed into any particular part of the body. The training of the will by Prānāyāma gives exercise to the mind, so that, in course of time, it acquires a capacity to respond to the higher vibrations, and becomes what may be called super-conscious; such is the object of Prānāyāma in the science and philosophy of Yoga.

This introduction of rhythm into our respiration brings us to the technique of Prānāyāma, which is summed up in three Sanskrit words: Puraka, Kumbhaka, and Rechaka.

These three combined, form a breath unit. With one nostril open and the other closed, the atmospheric energy is breathed in; this is called "Puraka." This energy is then retained in the body by the holding of the breath. This is called "Kumbhaka." After this, the closed nostril is opened and the opened nostril closed and the breath is let out. This is "Rechaka." For the second breath-unit this same process is reversed without allowing any interval between successive breath-units. The ratio of the time of inhaling to the holding of the breath is 1:4; and that of inhaling to exhaling is 1:2. The longer the breath retained the more energy is absorbed and the greater the power of resistance obtained. We have seen some youths perform the daring feat of allowing a loaded cart to pass over their chests without their suffering any injury or having their ribs broken. The secret of this feat lies in the power of retention of energy in the fully expanded chest till the wheel has passed over the chest. In fact, many feats of physical strength depend on the process of Prānāyāma.

The Technique of Prānāyāma.

A particular Asana or pose is advised for the easy achievement of Prānāyāma. This pose is called Siddhāsana or the pose of accomplishment. In this Asana, the sitting posture is taken with the head and neck in line with the straightened spinal column. Further, the sitting posture is to be taken in such a way that the heel of one leg presses firmly on the perineum and the heel of

Pose for practising Prānāyāma.

the other leg on the pubis. The gaze in this posture is directed at the root of the nose between the eye-brows. A suitable posture and Prānāyāma are the two stages necessary to will a thing or a desired object by concentrating the attention with all energy on the object desired. This is what the New Thought literature, which is flooding the market, is trying to teach and this is what Emile Couè of France told us to do to keep disease away by concentrating our thoughts on his favourite formula: "Day by day, in every way, I am getting better and better." These thoughts may be new to the Western world but to us they are as old as the hills. Here again, a warning is given not to use the power gained by Prānāyāma for the attainment of unholy objects, or with the object of attaining psychic powers, because then follows an entanglement in surrounding objects due to keeping the self under bondage to the flesh, and the after effects of these are to be found in the wearing away of these powers and in loss of mental balance. But, when these powers are used for the liberation of the self from the bondage of the flesh, by curbing evil emotions and unholy passions, the mind overthrows the dominion of matter and the thraldom of sensual pleasures.

Anyone cultivating spiritual concentration will perceive subtle changes taking place in his nerves and a development of higher faculties takes place in him after Prānāyāma is attained.

The next step after Prānāyāma is Pratyāhāra which means the restraining of the senses from gratification in many

ways. Next comes Dhāranā *i. e.* the holding and fixing of the mind on certain points to the exclusion of all others, that is, the fixing of the attention on heart or on the image of God. Dhyāna is the next step in Yoga and means contemplation of the Self; that is, when the mind is freed from the thraldom of the senses, it is not allowed to wander outwards but is employed in the contemplation of the Self or Atman. These last two naturally lead to Samādhi which is the state of super-consciousness. It means absorption in meditation either with retention of self volition (Savikalpa) or with loss of volition (Nirvikalpa). In this state, the Soul is able to enjoy its own Self, which is Entire Bliss.

Pratyāhāra, Dhāranā Dhyāna & Samādhi.

The various processes suggested by Pātanjali for the attainment and realisation of Eternal Bliss form a royal road to reach this goal. The conscious mind acts as a gate closing this road and it requires eight Keys to unlock it. With the first key—Yama—the flow of the mind is regulated in such a way that it will be purificatory in action and raise the moral tone. Pātanjali, to begin with, does not restrict one's actions; it advises action but action in such a way as not to cause injury to others; it allows one to receive, but to receive not as a gift for work done; it does not restrict speech but advises one to speak the truth; it instructs one to hear, but to hear only what is good; it urges one to practise courage but to practise it only when in difficulty. In fact,

Significance of the various steps of Pātanjali.

with this key one is able to achieve control of spiritual activities—Satva-guna—in the mind. With the second key one is advised to restrict the activity of the mind completely in a particular direction, that is, to abandon any act for which there is a craving, to suppress a particular desire and its manifestation. This key is called Niyama. The third key is called Asana. This controls all the physical activities, the energy of control being centred in a particular pose. This is necessary because the unchecked restlessness of the body might otherwise dissipate the energy of the mind. The energy of the mind controlled by Yama, Niyama and Asana is then directed towards exciting a subtler side of the mind by exercises of rhythmic breathings of a particular order. This key is called Prānāyāma. The fifth key is called Pratyāhāra by which the activity of the conscious mind is completely restrained from flowing out of the organs of sense. The restrained senses are then directed inwards in search of this subtler or subconscious side of the mind, by concentrating restraint on an organ which works through the subconscious mind, such as the heart or some other involuntary organ of the body. This sixth key is called Dhāranā. When the attention has been fixed on a point in the body, meditation on it is necessary in order to realise the energy through which it is working. This is the seventh key and is known as Dhyāna. By continued meditation, consciousness of the subtler side of the mind—the subconscious force in the body—is achieved and the conscious mind becomes merged in it. This is Samādhi, the eighth key. By means of this Samādhi a man can obtain anything, material or spiritual. If the object be material

gain, there is a violent return to the conscious mind in order to gain the object of desire, but if the object be spiritual, a stage called Nirvikalpa Samādhi is entered in which all desires are burnt out and eternal freedom from this physical world is obtained.

Some of these keys are easy to handle with practice but some have become so rusty by disuse, that they will not fit into the lock and the gate of Liberation refuses to open. One might, by force of will and practice come to control all physical activity, though it is not so easy as it seems. All voluntary actions are under the control of the cerebro-spinal nervous system over which we have conscious control. It is through this system that we manifest our desires, thoughts and emotions, which are of a subconscious origin. Our conscious activities are more or less educated to do certain things by force of habit and they vary in different periods of life or in successive lives. Our subconscious activities, on the other hand, are eternal; they are the same in different periods of life, and in all lives past and future. They are only modified by the web of impressions gathered during the period of successive embodiments. The subconscious is the presiding deity of the body ; it has a continuity behind it ; it is forceful in its action.

Our voluntary nervous system, even if controlled, would not be helpful in gaining the object of achievement for the subconscious force within, under the direction of which it acts, would force the conscious nervous system to liberate the impressions it had received during previous

embodiments. Unless and until one establishes conscious control over the subconscious activities, which are manifested as involuntary activities of the body and include thoughts, desires and emotions, it is not possible to enjoy philosophic Bliss or, in other words, one cannot open the door leading to Liberation.

By suppressing all our voluntary and involuntary actions we can bring the working of the body to a standstill, and our emotions, desires and thoughts, deprived of their mainspring, do not arise. The mind then, having nothing to work through, is directed to higher channels of action in order to gain its freedom. Control over the autonomic nervous system, which is an unconsciously acting portion of the general nervous system, gives one power to achieve miracles which are known as Siddhis of which I will speak later. It is enjoined by the scriptures that energy of control should not be wasted in performing them but should be directed towards the attainment of the Real to gain Nirvānic Bliss which is obtainable by practice of Yoga—the suppression of all thought.

Importance of Dhāranā.

So far I have explained the different steps necessary for the attainment of Yoga and their significance. Of these steps, Dhāranā is an important step from the medical point of view, for a Yogi, when he is in this state, receives what he calls an internal vision, and is able to see what is going on in his body or in nature. In fact, everything in nature is an open book to him; there

are no secrets from him. He sees into his body, how the different organs work, how Prāna or the vital force is transmitted in the body, how it encounters different Chakras or plexuses of nerves; how, with the holding of Prāna in a particular Chakra, the different organs are interfered with, producing activity or sluggishness. All this is recorded by them, not merely logically but axiomatically, and the required result follows.

Yoga controls the Nervous System.

Old Yogic literature, later than Pātanjali, explains to us, in detail, how the nerves are distributed all over the body, and how they may be used for the influencing of the different organs which are normally not under our control. In fact, all the physical practices of Yoga are directed towards bringing under control that portion of the nervous system about which as yet we know very little—I mean, the sympathetic nervous system. Whether that system is a vestige of our animal life or the beginning of a new nervous system which, in future, is to play an important part in our existence, it is difficult to decide.

The Sympathetic & Cerebro-Spinal Elements.

Cunningham, in his Anatomy, says that "about the philogenetic relations of the sympathetic and cerebro-spinal elements in the system it is impossible to determine. It may be that the sympathetic system is the representative of an ancient architecture independent of the cerebro-spinal nervous system; or it may be

that the corroboration of the spinal nerves and the sympathetics are both consequences of a formation of new organs and structure in the splanchnic area. Examined in every light, it possesses features which effectively differentiate it from the cerebro-spinal system, although it has become inextricably united with it, and subservient to it."

The Autonomic Nervous System

A resumé of the sympathetic system will not be out of place at this juncture. Owing to the slightly antagonistic fibres arising from the sympathetic ganglia (collections of nerve cells) located in the body and from the ganglia situated on some of the cranial nerves, it has been now considered wise not to extend the term sympathetic to the latter but to call them para-sympathetic and to include both these terms, sympathetic and para-sympathetic, under the common nomenclature of the Autonomic System as suggested by Langley. The word autonomic indicates that these fibres possess a certain power of self-government and are to some extent independent of the central nervous system.

The Sympathetic portion.

The sympathetic chain is a system of ganglia longitudinally arranged on both sides of the spine and called Vertebral or Lateral ganglia. In connection with Lateral ganglia are other outlying ganglia, placed in front of the vertebral column, from which various sympathetic plexuses take their origin and these are called Pre-vertebral or Collateral ganglia; while there is a third set of ganglia situat-

ed in the walls of the organs themselves and called Terminal ganglia. All these three sets of ganglia, with strands connecting them together, ultimately connect with the spinal nerves and pass through them and the blood vessels for distribution to the skin, blood vessels, glands and abdominal and pelvic viscera. The general purpose of sympathetic activity is to prepare the body for quick violent reaction to its environment, and consists of acceleration of the heart, dilatation of the pupil and sphincters of the anus and bladder, inhibition of the peristalsis of the viscera, and of secretions of the salivary and sweat glands.

Its purpose.

The para-sympathetic includes the fibres, lying for the most part in the vagus (the bulbar portion) and also to a lesser extent, in the third, seventh, ninth and eleventh cranial nerves; and the sacral portion, consisting of fibres, leaving the cord in the nerve trunks of the second, third, and fourth sacral nerves. Through the Vagus, — by far the most important part of the para-sympathetic system—are supplied fibres to the heart, bronchiæ, gullet, stomach, intestine and pancreas. From the sacral portion, through the Nervi-erigens are supplied the portion of the large intestine called the descending colon, the rectum, anus and genital organs.

The Para-Sympathetic portion.

The purpose of para-sympathetic action is to slow the action of the heart, increase the activity of the digestive tract, stimulate salivary and digestive secretions and aid in the

general upbuilding and anabolic activity of the body. The general effect, therefore, is that of conserving the bodily resources and building up a reserve of energy, and energy yielding material to be called upon and used in time of need by the action of the sympathetic.

Its purpose.

It will thus be seen that the action of the sympathetic fibres is directly antagonistic to the fibres of the para-sympathetic. In fact stimulation of one set of these fibres, causes inhibition of the other set. From what I have said it can be gathered that the acceleration of the katabolic function is more a part of the sympathetic portion of the autonomic system, and the inhibitory or anabolic function a part of the para-sympathetic portion *i. e.* mainly of the Vagus.

Sympathetic V. Para-sympathetic.

That the Yogis by practice can come to control the autonomic nervous system is a fact, glimpses of which were given to us by Deshbandhu when he performed his feat of stopping the pulse of one hand only, while the rest of the arteries were beating! What suspicion could one raise of compression by muscle contraction when he stopped the beating of the most superficially placed artery viz. that of the Temporal? Our physiologists are at fault; they cannot explain it. It must be borne in mind that

Control of the Autonomic Nervous System.

when the radial pulse of one hand was stopped, the circulation in the whole arm was stopped, but when the pulsation in the temporal artery was made to stop, the Carotid artery was still beating, showing thereby that the controls used by him lay above the Brachial artery in the one case and above the Carotid in the other. What are these checks by which a Yogi inhibits action of vital parts of the body? These checks are called Chakras by them; in our modern phraseology I should call them plexuses. These plexuses are excited to action by Prāna-vāyu, that is, nervous impulse. I call these various plexuses, nerve-plexuses, not of the central nervous system, but of the autonomic nervous system. This invites us to investigate, whether or not the ancients had any knowledge of the internal anatomy of the body. Some of the Yogis later than Patanjali, who have described these various exercises to be performed by the student of Yoga for the control of Vāyu or nervous impulse, describe in detail, the construction and action of the nervous system. Did they then dissect bodies, to find out the internal construction of the body, so as to tally almost completely with our present knowledge of anatomy and physiology; or is it by some mystic vision that they obtained the knowledge of it? Whatever it may be, the fact remains that the anatomy of nerves given in the Tantric manuals can stand comparison with our present knowledge of them. According to them, there are ten important Vāyu-nādis *i. e.* nerves of impulse without a knowledge of which the process and technique of Prānāyāma is not possible. There are many more, but these have the power of carrying impulses

(Prānavāhaka). The following are their names and locations: Idā on the left side of the body; Pingalā on the right side; Sushumnā in the centre of the body piercing the skull and joining the Bramha-chakra *i. e*, the cerebrum; Gandhāri in the left eye ; Hastajivhā in the right eye ; Pushā in the right ear ; Yashaswini in the left ear ; Alambushā in the mouth; Kuhu in the penis, and Shankhini in the Mulasthāna *i. e.* perineum. Of these ten nādis, three are the most important and these are, Idā, Pingalā, and Sushumnā, and I will describe them in detail in the same way as is done in the old Yogic literature. But it must be borne in mind that the rest of the nādis, from their position, appear to be nādis which carry impressions to the brain by means of the five senses.

Nerves Mentioned in Yogic literature.

The first is Idā, the location of which is on the left side of the Meru-danda *i. e.* the spinal column and ends in the right nostril. The second is Pingalā which is on the right side of the spinal column and ends in the left nostril. From the description, it seems that these "nādis" cross each other before their respective endings and have their origin, or mouth as it is called, in the plexus of nerves called "Mulādhāra-chakra" which is situated in Mulasthāna, that is, the perineum. According to our present knowledge, I think that the Mulādhāra-chakra is the Pelvic plexus of the sympathetic system. From this description of the nādis, it appears that Idā and Pingalā are the gangliated cords of the sympathetic system, which we know to be

Location of the Idā and Pingalā Nādis.

situated on each side of the spinal column; at the cephalic end, each sympathetic trunk passes into the cranial cavity and they arborise with each other, forming a plexus and thereby form complex relations with the spinal cord (known as Sushumnā-nādi) where it joins the brain. This plexus is called in Yogic literature "Bhrukuti-Chakra." At the caudal end, the two sympathetic trunks join together by fine filaments with the pelvic plexus.

Location and description of Sushumnā Nādi.

The third nādi Sushumnā, is centrally situated and passes through the Meru-danda *i. e.* the spinal column. It originates inside the 'Kanda' *i. e.* the sacrum which is on a level with the navel.

It runs up the body from this point and pierces the Talu *i. e.* the base of the skull, and joins the plexus of nerves of a thousand branches called Brahma-chakra *i. e.* the cerebrum in the vault of the skull. This nādi, as it ascends and reaches the level of Kantha *i. e.* the region of the larynx, is divided into anterior and posterior parts. The anterior portion goes towards the Ajnā-chakra *i. e.* the plexus of command which is situated between the two eye-brows and joins the Brahma-Randhra *i. e.* cavity in the Brain.

The posterior portion passes from behind the skull and joins the Brahma-randhra, which is supposed to be a cavity

in the brain from which the Yogi liberates his soul and it is this posterior portion that is to be developed by a student of Yogic science.

This description of the Sushumnā nādi concurs with that of the spinal cord and is very nearly accurate. It seems that they had a knowledge of the function of the two portions anterior and posterior, of the spinal cord, when they say that the anterior division of the nādi goes towards the Ajnāchakra *i. e.* to a point in the frontal lobe of the brain (the lobe of intelligence) from which are issued the orders to move the different parts of our voluntary muscles, and that it is a plexus which is controlled by our thought. The Yogi is told to develop the posterior portion of the nādi, which governs all sensations and supplies all the vital organs of the body, a portion which is not normally under our control. Of all the ten nādis these three then are the principal, and of the three Sushumnā is the most important. The importance of this nādi lies in the fact that through it by certain practices, one can put a stop to the flight of time, by drawing Prāna (Vitality) from the Idā and Pingalā nādis, *i.e.* by consciously controlling the incessant working of these sympathetic cords, and thus put a stop to the katabolic activity of the body. This conscious control over them, which could only be achieved through the Sushumnā nādi, suspends the general wear and tear in the tissues of the vital organs, and thus life is prolonged. When the Idā and the Pingalā nādis are thus devitalised

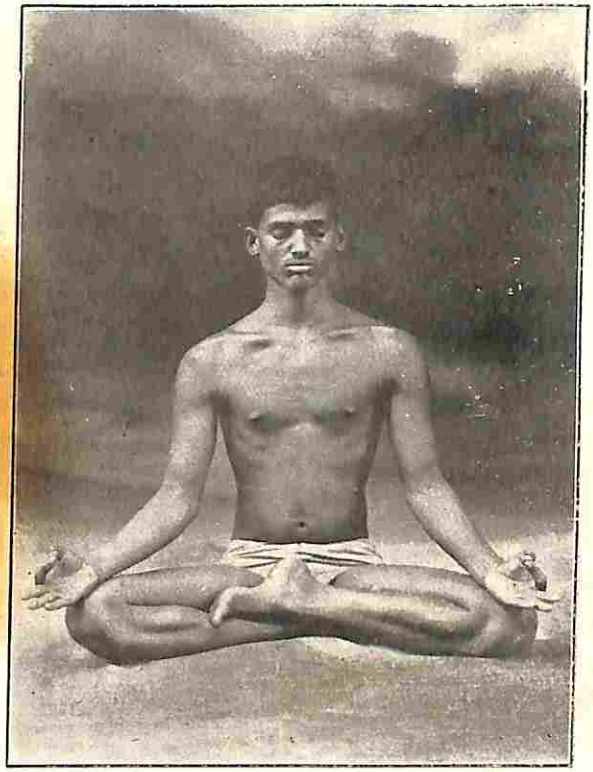
Control of Sushumnā annihilates time.

by the Sushumnā nādi there is said to exist no night or day for a Yogi *i. e.* Sushumnā is said "to devour time."

Through Sushumna latent powers are developed.

It is also through this Sushumnā nādi that we obtain knowledge of our relations with the external world. But a knowledge of the Self and a control of the vital organs can only be achieved by conciously controlling the Idā and Pinglā nādis which form a connecting link between the prevertebral plexuses (chakras) of the sympathetic system and the Sushumnā nādi; but all these plexuses in order to excite the Sushumnā nādi by their connection with it must work through the Kundali-chakra. In fact, what the brain or medulla is to the central nervous system, Kundali-chakra is to the sympathetic system. Normally, the central nervous system is well developed while the other lies dormant; but when the latter is made active by certain processes described in the Hatha-Yoga and Prānāyāma and by the constant impressions thus made by these exercises on the Kundali chakra, then a person develops the power to do certain things which are beyond the scope of an ordinary individual. Things done by these persons are considered as miracles, though they are normally done by them. They are due to a latent power within us which requires development. A Yogi, when he developes his autonomic nervous system, becomes so engrossed in it that the somatic functions of his Sushumnā nādi and the knowledge of his relations with the external world are held in abeyance and he sees his Self pervading the whole universe and becoming one with it.

Plate II.



SIDDHASANA.
(Vide page 18)

The excitement of all the chakras mentioned above, takes place always through "Kundalini". "It is the lever of consciousness by which the individual realises his oneness with the Absolute. The creative impetus, which emanates from the divine, is communicated through Kundalini, or the serpent power as it is called, to the six chakras or plexuses and their branches. Normally, this Kundalini is in Yoga-nidra or sleeping a trance-sleep and when it is awakened from its slumber and made to work, the Yogi perceives all supernatural truths: the resurrection of the soul from the grave of untruth becomes an actual fact, and perception of beauty which is an attribute of the Self fills his heart with joy. Health is also said to be the gift of Kundalini; "Kundalinī is the mother of joy, of sweet rest, of sleep, of faith, of wisdom." Kundalinī is the queen and guide of lives that breathe, *i. e.* of all vertebrate animals. What is this "Kundalinī" to which such wonderful powers are assigned and which plays such an important part in the autonomic system? Kundalini has long remained a mystery. In the following pages I hope to make an attempt to solve the mystery.

The Mysterious Kundalini bestows supernatural power.

Swami Vivekānanda in his book 'Rāja Yoga', defines Kundalinī as follows—"The centre where all residual sensations are, as it were, stored up is called Mulādhāra-chakra, and the coiled up energy of actions is Kundalinī "the coiled up."

Kundalini as described by others.

Arthur Avalon in his book "The Serpent Power" states that "Kundalini is the Static Shakti." He says further: "It is the individual bodily representative of the great cosmic Power (Shakti) which created and sustains the universe"; and in support of his statement he gives at the end of the book the scientific and masterly exposition of this Shakti, composed by his friend Prof. P. Mukhopadhyaya. All the explanations about this Shakti, though learned could as well apply to the autonomic nervous system. The Static or anobolic power is the parasympathetic portion of it, and the Dynamic or katabolic power is the sympathetic portion. Some have suggested that Kundalini is the Inferior Vena Cava, while others conjecture the large bowels. On what basis they have come to these conclusions, I am unable to say (perhaps they are thinking of the curves which these have.)

Location of the Kundalini.

According to Hatha-Yoga-Pradipikā, the Kundalini is said to be lying dormant guarding the opening of the passage that leads to the seat of Brahma. This seat is said to be Brahma-randhra, that is the cavity in the brain. The opening to that cavity, in my opinion, is the hole at the end of the fourth ventricle in the brain, which communicates between the Brahma-randhra and the channel in the Sushumnā as well as the Subarachnoid space outside known as Akāsha. The dormant Kundalini thus guards the three important openings in the cerebro-spinal nervous system. Unless she is awakened, or made consciously active, one cannot send his embodied soul (Jīvātmā), which is supposed to reside in the heart, along the Sushumnā nādi to the Brahma

randhra nor is he able to assist the soul captured in the Randhra, to get out of the body to join the Universal Soul (Paramātmā) outside.

Location and description of the Kanda.

On the same authority the Kundalinī is said to be sleeping above the "Kanda"; and the shape of the Kundalini between these points has been described as being like a serpent. To understand the exact extent of this Kundalini we must locate the position of the "Kanda" in the body. Different authors have given slightly different locations to this "Kanda" but they all agree in this that it is placed in the lower part of the body above the anus, and that its size is about four angulis *i. e.* about 3 inches in length, and an equal number of inches in breadth; that it has the shape of a leaf or triangle, or that of a bird's egg, broad above and narrow below, and that it is covered with a soft, flimsy, plaited white cloth.

According to Goraksha-shataka the situation of the Kanda is on a level with a point between the navel and the penis. That point corresponds with the upper border of the triangular piece of bone of the spinal column which is wedged in between the two hip bones and is known as the sacrum, the upper border of which is known as the promontory of the sacrum.

Location discussed.

By Yājnavalkya, the Kanda is located about nine angulis *i. e.* 6 inches above the mid-portion of the body and extends about 4 angulis in length and in width. The mid-portion of the body is said to be the space which is two angulis (a little over

an inch) above the anus and an equal number of angulis below the root of the penis. This space, according to our knowledge of anatomy, corresponds with the Coccyx, the lowest bone of the spinal column. A distance of nine angulis above this space corresponds with the promontory of the sacrum. In Hatha-Yoga-Pradipikā, the origin of Kanda is given as 12 angulis *i. e.* 9 inches above the raphè of the perineum and that too corresponds with the promontory of the sacrum.

Though the different Yoga manuals have given different wordings for the location of Kanda, yet they agree as to its root which is a point between the navel and the penis.

This Kanda is also called Mula-kanda or Mulādhāra, that is root-bulb or root-support, probably of the Merudanda. This Mulādhāra is said to be the receptacle of a plexus or a chakra called Mulādhāra-chakra; it is also said to form the posterior boundary of the Yoni *i. e.* perineum. The soft white plaited cloth with which it is said to be covered is, I think, the pelvic fascia with its folds which lines the internal surface of the sacrum.

Kanda and Kundalini.

This description of the Kanda seems then to identify it with the sacrum, though Kanda is translated 'ganglia' in some of the Marathi and English books on Yoga. At its place of origin, which is above the promontory of the sacrum, Kundali is said to be lying dormant in the shape of a serpent coiled round itself. Lower down it joins the Mulādhāra-chakra which is at the end of the Kanda *i. e.* the sacrum, and, higher up, it passes through the dif-

ferent chakras, the names and descriptions of which will be given presently, and meets the brain through an opening in Talu *i. e.*, the base of the skull.

In the Tantrik Manual, Shat-Chakra-Nirupanam, it is said that the pericarp of the Adhāra–lotus is a triangle or Kanda mentioned in the Hatha-Yoga-Pradipikā; and inside this triangle there is a linga *i. e.* phallus called Swayambhu, which tapers like a new unopened leaf-bud. This description of the phallus tallies with the lower end of the spinal-cord with its dural sheath, which ends in the sacrum (Kanda) in a cul-de-sac at the level of the second sacral vertebra. This phallus extends a little beyond the triangle, and, above it, the Kundalinī is said to be sleeping, closing the mouth of the Brahma-dwāra; *i. e.* on a level with the lower end of the spinal canal called Chitrā. This position of the sleeping Kundalini agrees with the position of the lower end of the dormant Kundalini mentioned in the Pradīpikā.

Kundalini & Sushumnā.

It appears from the description and position of the dormant Kundalini that it must be a prevertebral plexus of the autonomic nervous system, and that plexus I take to be the Solar Plexus of the sympathetic which lies on the vertebral column on a level with the first and second lumbar vertebra, where the lower end of the spinal-cord, called the the Conus-medullaris, with its canal comes to an end. From this sleeping Kundalini, otherwise called Kula-Kundali, there is described as extending a fibre which descends and shines in the cavity of Mula-lotus like a chain

of brilliant lights. From the skirts of this dormant Kula-Kundali there starts another Kundalini, which ascends along the Sushumnā nādi and reaches, as said elsewhere, to a point (Bindu or Para-Shiva), which is bathed in the stream of the ambrosia (Cerebro-spinal-fluid) from the Eternal Bliss (Brahma-randhra), and illuminates even the lowermost cavity of this bodily universe by her radiance.

It will thus be seen that Kundalini extends from the brain to the Mulādhāra chakra and is divided into two parts by the Kula-Kundali which rests on the lower end of the spinal canal, called the gate of Brahma *i. e.* Brahma-dwāra.

Kundalini & Brahma-dwāra.

Whether the Brahma-dwāra should be taken to mean the lowermost end of the spinal canal, or its highest end, where it joins the Brahma Randhra, or whether it should be taken to mean the whole of the spinal cord, by which the Kundalini as a conscious force is made to ascend to the Sahasrāra, is decided by the description given in the Shat-Chakra-Nirupanam, that the Kundalini as a sleeping or unconscious Shakti or power resides in the lower gateway of Brahma and is excited to conscious activity at the upper gateway of Brahma. Thus between these two points is situated the Parameshwari or the Kundalini of lives that breathe.

When this Kula-kundali is awakened or made active, it forces a passage through the different Chakras and excites

them to action, and, as it rises step by step, the mind becomes opened and all visions and wonderful powers come to a Yogi, when it reaches the brain. The Yogi then is perfectly detached from the body and the mind, and the soul finds itself free in all respects.

The awakening of Kundalini.

Before I actually define Kundalini according to our present knowledge of anatomy, I should like to name the six important Lotuses or Chakras (plexuses) with their present anatomical equivalents, which are made active by impulses from Kundalini.

Chakras or Plexuses.

The lowermost Chakra, with which Kundalini forms a connection and through which it is able to send impluses, is the Basic-plexus called the Mulādhāra-chakra. It has four branches (Dala) and the shape of a triangle, or, in the words of the Garuda-Purāna, the shape of the pudendum pubis (Bhagā). This description tallies very accurately with the description of the Pelvic plexus of the autonomic system, which is situated near the sides of the rectum. It is a continuation of the hypogastric plexus which bifurcates below into lateral portions and assumes the shape of a triangle; by contemplation of this chakra the Yogi obtains freedom from disease, knows the past and the future and gains all psychic powers. It also forms connections with the Swādhishthāna-

Locations & powers of Chakras.

lotus or the chakra which is situated in the pelvic region or Guhya-desha, just on a level with the root of the penis. This is probably the hypogastric plexus and has six petals or branches. By contemplation of this, freedom from death and disease is obtained. Higher up still, Kundalini forms itself into a plexus, which is known as the Kundali-chakra or solar plexus and its location is in the region of the navel; its extension upwards is called Manipura-chakra, which we know as the plexus of the Coeliac-axis. In fact, no distinction is made between the Kundali and Manipura chakras. It is supposed to be of a red colour and to have ten branches. It is called the Lotus of Happiness. By contemplation of this chakra, a Yogi is able to enter into another person's body; he obtains power of transmuting metals, and of healing the sick and also of clairvoyance. After passing through these Chakras, it forces its passage through the Anāhata-chakra, which is located in the Hridayadesha *i. e.* the region of the heart, and has twelve branches. This description appears to identify with the Cardiac plexus of the sympathetic system. By contemplating this lotus, a Yogi becomes clairvoyant and clairaudient and is able to see adepts moving in the air, and gains the power of travelling at will to any part of the world by the exercise of his volition. Of the six important lotuses or plexuses, the one situated in the region of the throat near Kantha (Pomum Adami), known as Vishuddhi-chakra, has sixteen petals or branches. It is probably the pharyngeal plexus of the sympathetic and it is said to be the lotus of purification, *i. e.* by contemplating this lotus, the whole body is purified of

diseases and complaints, and a Yogi is able to live for 1000 years in eternal youth ; in fact, he is dead to all the outer world and becomes absorbed in his inner life. The power in the curse of a Yogi also depends on this lotus. We, as men of science, are likely to laugh at the various powers assigned to the different plexuses. Still, we have read of things in the ancient Vedic and classical literatures which have turned out to be true. Whether all this is possible or not, I would not like to say. There is nothing impossible under the sun.

Kundalini then passes to the Tāluka-chakra *i. e.* the cavernous plexus of the sympathetic system which is situated at the base of the skull, and thence joins the Ajnāchakra. This chakra is the Naso-ciliary extension of the cavernous plexus of the sympathetic through the opthalmic division of the fifth cranial nerve, ending in the ciliary muscles of the iris and at the root of the nose, through the supra-orbital foramen. It has two petals or branches and is situated between the eye-brows. It is the spot which is contemplated while undergoing the process of Prānāyāma. Here is found the great light, the third eye as it is called, and by contemplation of this a Yogi gains most wonderful psychic powers. This chakra is called the plexus of command.

Kundalini or Kundali then joins her lord Parā-shiva the (olivary body) who has the form of a dot " O " (Bindu-rupā) and is situated in the Itara-linga (medulla oblongata) which has the peri-carp of Brahma-chakra (cerebrum). Kundalini thus connects herself with

Brahma-randhra, a cavity in the brain, where the Brahma *i. e.* the Soul, is located, and the knowledge of which the Yogi seeks to attain. It is this cavity which is guarded by six doors, and Kundalini is the only force that can open them. It, is this cavity, where Prāna *i. e.* energy centres all its activities; it is here where the soul is carried to reside; it is here that the unruly Chitta *i. e.* the mind-stuff, is captured and made steady by the process of Prānāyāma; it is here that the Chitta is sub-merged in Prāna—this submersion bringing all the activities of the mind and Prāna to a standstill; it is only when the mind and the Prāna act as two separate entities that they run riot and keep the soul in the bondage of Māyā *i. e.* the sourrounding objects of the senses. The soul, thus made free from the thraldom of the intellect, feels its own joy and sees itself—"So'ham" *i. e.* "I am That" or "I am He", literally "That am I". Though the soul is freed from the shackles of Prāna and Chitta, it is still made to remain there by the current of Vāsanā, which is guarding the orifice of this cavity in the form of Kundalini, the cord of desire. These desires are likely to throw back the soul under the control of Prāna and Chitta (the mind stuff), and successive rebirths are the result. This is not what the Yogi desires; he wants to escape this, which can only be done by tearing asunder the cords of desire *i. e.* by bringing Kundalini under control, and when Kundalini is made to obey the callings of the soul, the soul escapes from this cavity to occupy another cavity

Kundalini & the six doors leading to Brahma-randhra.

called Akāsha, which surrounds the brain and the spinal cord. The soul, thus made free from the control of Prāna, Chitta and Vāsanā, lives outside the Bramha-chakra *i. e.* the cerebrum, and is said to pervade the whole universe. When the Yogi attains this state, he is said to be in the Nirvikalpa Samādhi *i. e.* seedless Samādhi by which he gets in tune with the Infinite and is freed from rebirths.

The origin of Vāsanā traced.

A question may be asked as to what we are to understand by the term "Vāsanā" *i. e.* Desire, which leads an individual to successive re-births. To know the proper meaning of the term, according to Indian Philosophy, we shall have to talk about the "Karma" of the embodied soul, the "Jivātmā," of a being. The "Karma" of an individual is comprised of desire (*i. e.* Vāsanā), knowledge (*i. e.* Jnāna), and action (*i. e.* Kriyā). The impressions unconsciously left on the mind by actions in past lives (Vāsanā) start a current of thought, which is conveyed to the Jivātmā, and is then translated, through his agency, into action, either good or bad. Our good actions lead us to happiness while the bad ones to misery. This Karma is of three kinds *viz.* first—Sanchita (stored up) Karma *i. e.* all the accumulated and unexhausted Karma of past lives which is still to bear fruit and is born with the individual as Samskāra or Vāsanā (desires) *i. e.* impressions of past lives. The second form of Karma is Prārabdha *i.e.* that part of the Sanchita-karma which is worked out and the result of which is made known to us in our

present birth, and the third Karma is Vartamāna otherwise styled " Kriyamāna " *i. e.* the present, and Agami *i. e.* future which a man is continuously making by his present and future actions. It will thus be seen that the vicious circle of Vāsanā is continuously forcing the embodied soul to generate a new Karma, and to experience the past Karma, and this can only be put a stop to by conquering our Vāsanās *i. e.* desires. When this is done there is nothing left to generate new Karma, and the Jivātmā is liberated from successive births. On the physical plane, this can only be done by controlling the cord of desire, the Vagus nerve (Kundalini) *i. e.* by consciously controlling all the involuntary actions of the body, which are more or less under the control of the Vagus nerve. The submersion of the voluntary and involuntary actions of the body into Chitta and Vāsan brings all the functions of the body to a standstill. The embodied soul (Jivātmā), thus made free from the activities of the body, merges in the Supreme Soul (Paramātmā) outside the body and gains its final emancipation, *i. e.* liberation from re-birth.

Randhra defined.

All the writers on Yoga have translated Randhra as 'hole'. It could as well be translated as cavity (Apte's Sanskrit dictionary), and I would rather put that second interpretation on the word " Randhra " as it is more in keeping with our knowledge of Western anatomy. This cavity is surrounded by a chakra or plexus of a thousand branches, known as Sahasrāra or

Bramha-chakra *i. e* the cerebrum. Here the word thousand should not be translated too literally. It is there to convey the idea of innumerableness. This Randhra is the cavity lying between the four inter-communicating ventricals of the brain and is continuous with the central canal of the Sushumnā nādi *i. e.* the spinal cord, known in Yogic literature as Chitrā. This cavity is constantly secreting a fluid called the Nectar of Life or the divine fluid *i. e.* the cerebro-spinal fluid. At the end of this cavity is an orifice which connects the internal cavity of Prāna with the external cavity of Akāsha surrounding the brain and the spinal cord and known as the sub-arachnoid space and is bathed with the divine fluid which is secreted by the Bramha-randhra.

Kundalini a Nerve.

It appears from this description of Kundalini that it must be a nerve, which when excited, carries impulses to the various plexuses just mentioned, which plexuses, in their turn throw out filaments to the Sushumnā nādi, at their various levels, to get the knowledge of their working.

What can this nerve Kundalini be, which plays such an important part in the life of a Yogi ? To discover this, we must identify Kundalini with one of the cerebral nerves according to our present knowledge of anatomy and physiology.

There are eleven pairs of nerves which issue from the brain. Of these there is one pair of nerves, the longest, which reaches the level of the navel, where it ends in a plexus (Kun-

dali-chakra) and then gains connections with other plexuses, which are situated lower down, through branches from the solar plexus. That pair of nerves we know as the Vagal pair, and forms the bulk of the parasympathetic portion of the autonomic nervous system. It is popularly called by some English authors "the wandering nerve."

Kundalini identified as the Vagus nerve.

To my mind, Kundalini or the serpent power as it is called is the Vagus nerve of modern times, which supplies and controls all the important vital organs through different plexuses of the sympathetic portion of the autonomic system. A few have tried other interpretations of Kundalini but, none, to my knowledge has interpreted it in this way. I will here trace the course of the Vagus nerve and its communications with the different plexuses of the sympathetic system and compare it with the course of the Kundalini as given in the books of Yoga.

The Vagus nerve, its source and function.

The Vagus, pneumogastric or tenth cranial nerve, as we know, is developed from the hind-brain, and has a more extensive distribution than any of the other cranial nerves. It is, perhaps, the only nerve which is composed of motor and sensory fibres both efferent (inhibitory) and afferent (acceleratory).

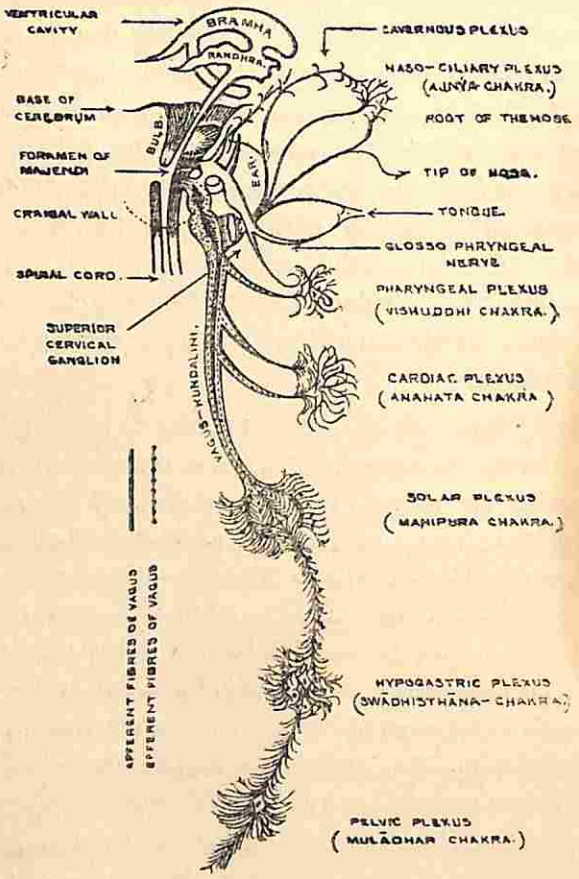
It arises with other cranial nerves (the ninth and eleventh) from the grey matter in the floor of the fourth ventricle, where it is attached by eight or ten filaments to the medulla oblongata in the groove between the olive and restiform body.

The nerve, as it emerges from the jugular foramen at the base of the skull, presents a well marked swelling, called the ganglion of the root of the vagus (jugular ganglion). This ganglion sends a branch to the carotid plexus which is situated at the base of the skull and is known as Tāluka-chakra. After its emergence from the jugular foramen, it presents another swelling called the ganglion of the trunk of the Vagus (ganglion nodosum); from this the Vagus nerve passes along the spinal column vertically down through the neck, chest and abdomen where it ends into a plexus and forms connections with the solar plexus.

On its journey downwards and before it ends, it sends branches to the prevertebral plexuses of the sympathetic portion of autonomic nervous system. In the neck, it sends a branch to the pharyngeal plexus *i. e.* Vishuddhi-chakra; in the thorax it sends branches to the deep and superficial cardiac plexuses *i. e.* Anāhata-chakra; in the abdomen it forms connections with the plexus of the cœliac axis *i. e.* Manipura-chakra, and then ends in a plexus known as the solar plexus *i. e.* Kundali-chakra which is the downward extension of the Manipura-chakra. The Vagus also supplies branches to the renal, hepatic, splenic and pancreatic plexuses.

The uniqueness of the Vagus nerve.

The Vagus is the only nerve which is composed of motor and sensory fibres, both efferent *i. e.* outgoing, and afferent *i. e.* in-coming. The efferent fibres are inhibitory or anabolic in action while the afferent are accelerator or katabolic in action.



PLAN SHOWING THE ORIGIN, CONNECTIONS AND THE ARRANGEMENT OF THE AFFERENT AND EFFERENT FIBRES OF THE VAGUS NERVE.

The efferent fibres.

The efferent fibres, which exercise a restraining influence over the action of the larynx, pharynx, lungs and heart, start from the medulla oblongata and are always, according to the manuals of Yoga, kept in action by the divine fluid *i. e.* the cerebro-spinal fluid, which is secreted by the moon in the brain *i. e.* by the moon-shaped lateral ventricles of the brain.

Their situation and function.

The efferent fibres originate in the cells of the ganglion nodosum but, as they enter the bulb, the fibres bifurcate. The ascending branches are short and arborise with the efferent fibres of the bulb above. The descending fibres go downwards from the centre of the Vagus nerve and form connections with the fibres of the sympathetic in the solar plexus, and through them with the plexuses situated lower down. From this description of the fibres of the Vagus nerve, it will be seen that the stimulation of its centre in the medulla, either directly or indirectly, will cause inhibition of the functions of organs supplied by its efferent fibres; while there will be acceleration of the functions of the organs supplied by the afferent fibres. There will be inhibition of the functions of the heart, lungs and larynx, but acceleration of the movements of the stomach and intestine and dilatation of the blood vessels of the abdominal viscera, with consequent increase in the secretion of the digestive glands in the abdominal cavity.

The restraining influence of the centre in the medulla may be reflexly increased more easily by stimulation of the many afferent nerves, particularly those from the nasal mucous membrane, the larynx and the lungs. How these organs are used to influence the vagal centre was shown when we studied the object and the technique of Prānāyāma, but the greatest difficulty is experienced in obtaining this restraining influence from the alimentary tract and it is for that reason that Kundalini is said to be sleeping at this part and a student is advised to rouse this sleeping Kundalini to action by catching hold of her tail, that is by stimulating the ends of the afferent fibres of the the Vagus by various processes such as Prānāyāma with Banda and Mudrā (vide infra). The Vagus nerve may thus be divided in three parts. The first portion in the medulla is composed of efferent fibres and is situated at the base of the fourth ventricle of the brain, where the mouth of the sleeping Kundalini is located.

The second portion, from below the base of the skull down to its connection with the solar plexus, is composed of efferent and afferent fibres, is curved in shape, and is said to be the body of Kundalini.

The third and last portion is composed of afferent fibres and connects the hypogastric (Swādhishtāna) and pelvic (Mulādhāra) plexuses through the solar plexus; this is said to be the tail of the sleeping Kundalini.

Its physiological function explained in Yogic language.

It will thus be seen that the Vagus has the same course and connections with the important plexuses of the sympathetic as that of Kundalini. These plexuses of the sympathetic system send communicating branches to the posterior nerve-roots in the spinal cord called Sushumnā nādi. Sushumnā, in its turn, is connected by the centripetal fibres to the brain or Brahma-randhra-chakra, whereby the knowledge of action is brought about. This completion of the circle may occur at any level of the body according to the situation of the plexuses of the sympathetic system, and a desire to control any of the plexuses by means of the vagus may bring about inhibition in the functions of the organ supplied by the particular plexus, and it is on this assumption we can explain some of the miracles performed by the Yogi. The vagus or more exactly the Vago-sympathetic nerve, either by direct or reflex action, and more particularly by reflex, establishes a complete control over the unconscious automatic action of the involuntary muscular fibres by inhibition; this is what the Yogi desires, so that the normal automatic action may not interfere with his desire of becoming one with Him who is everywhere. According to the Science of Yoga, the brain is not the beginning but the end of all nerves, where the sum of all impressions of nerves on their journey upwards, is stored up, and is therefore called the Lotus of a thousand petals or branches and known as Brahma-randhra-chakra *i. e.* the plexus which surrounds the cavity from which the soul is liberated.

An apparent anomaly reconciled.

Having thus shown that the wonderful and mysterious Kundalini is the Vagus nerve of modern times, we are faced with a difficulty. We know of two vagi nerves, the right and the left, while in Yogic literature there is only one Kundalini spoken of. Had the writers on Yoga no knowledge of the second Kundalini ? Want of knowledge is hardly conceivable in the face of the very accurate description of the sensory nerves. Perhaps they knew that one of the " Kundalinis " was not as powerful as the other and could not form connections or pierce through all the important plexuses mentioned by them. Our present knowledge of physiology tells us that of the two vagi nerves, the left vagus nerve is not so plentifully supplied with efferent fibres as the right and it plays a very minor part in the formation of the solar plexus *i. e.* the Kundali-chakra, and of plexuses situated below it, while the right vagus nerve forms a direct connection with the solar plexus as well as all the plexuses of the sympathetic portion of the autonomic nervous system and also through its filaments going there forms indirect connections with plexuses situated below the solar plexus. Thus the stimulation at the source of the right vagus nerve, which forms the most important part of the para-sympathetic portion of the autonomic nervous system, can control the action of all the six lotuses or Chakras of the sympathetic system.

Kundalini corresponds to the right Vagus nerve.

The mention of Kundalini in the singular in the Yogic literature makes us believe that it must be the right Vagus nerve only and not the left. Once it is accepted that Kundalini is the right Vagus nerve, there remains the question of bringing it under control. No books of Western physiology give us a method of bringing this autonomic nervous system under control, nor do they tell us anything regarding the ways by which this particular nerve Kundalini can be controlled. Normally, the current of the vagus is constantly going on and regularly controlling all the vital organs of the body, automatically and unconsciously. When the Kundalini is doing this—its normal work—it is said in Yogic literature to be lying dormant. To us the only visible manifestation of the interference with the normal current of the vagus is either by poisons of certain diseases or by certain medicinal agents. This interference may be in the form of a stimulation or a depression, as is seen in the working of the vital organs supplied by the vagus. Its stimulation causes inhibition of the heart-action *i. e.* its normal rhythm: and depression of the current of the vagus puts the controlling action out of gear; the heart then, being under the acceleratory influence of the sympathetic fibres, beats faster. From this visible manifestation of the action of the heart, we can judge whether the current of the vagus is interfered with or not.

Is it possible to interfere with the normal current of Kundalini? To us it seems an impossibility, but to those who

have gone through the different processes for the achievement of Yoga it is possible, as was proved by Deshbandhu when he showed us his feats of stopping the heart and the pulse of a particular arm. These phenomena are mainly due to the stimulation of the Vagus *i. e.* the awakening of Kundalini.

The Pancha-Prānas.

To understand the process of the awakening of Kundalini *i. e.* the Vagus nerve, one must have a proper understanding of Pancha-prānas *i. e.* the five varieties of vital forces or energies that are located in the body, their functions and the currents or impulses they produce.

All our visible and invisible actions are under the control of Prāna (general) and this Prāna is named variously according to the location in the body and the function it controls. It is named Udāna, Prāna (proper), Samāna, Apāna and Vyāna. These five kinds of energies in the body are known as the Pancha-Prānas.

Udāna.

Udāna rules the region of the body above the larynx (Kantha) *i. e.* the portion located in the cranium and just below it. This Prāna keeps us on the alert as regards our senses. All the automatic functions located here are under the control of the cephalic division of the autonomic nervous system.

Prāna (proper) is located in the region between the larynx and the base of the heart. It governs the verbal mechanism and the vocal apparatus, the movements of the gullet, the respiratory system and the muscles engaged in it. These functions are governed mainly by the cervical portion of the autonomic nervous system.

Prāna.

Samāna is located in the region of the body between the heart and the navel and rules the machinery of metabolism for the maintenance of life *i. e.* the secretions of the stomach, the liver, the pancreas and the intestine, as also the circulation of blood in the heart and the blood vessels. This portion is controlled mainly by the splanchnic nerves arising out of the ganglia of the sympathetic portion of the autonomic system in the thoracic region.

Samāna.

Apāna has its abode below the navel and rules the automatic action of the kidney, the colon, the rectum, the bladder and the genitals *i. e.* it governs the entire excretory apparatus in the body. These functions are governed by impulses from the lumbar portion of the autonomic system.

Apāna.

Vyāna pervades the whole body and governs the movements of the body due to the extension and contraction of muscles, both voluntary and involuntary, and the joints and structure around them. This Prāna is said to be responsible for the erect posture of the body. This is more a reflex

Vyāna.

action through the spinal cord and through the stimulation of the autonomic ganglia situated vertically in the middle of the body.

Pancha-Prānas Physiologically explained.

Beyond the description given above nothing definite is said about these Pancha-Prānas; but, from their location and the functions they perform, I am inclined to think that they are the five important subsidiary nerve centres in the brain and spinal cord. These centres unconsciously control the katabolic activity of the sympathetic portion through the fibres of the parasympathetic which are anabolic in nature, and are called Shaktis of the Chakras. Every involuntary act in the body is governed by these two sets of fibres; when their activities are evenly balanced, their presence is not felt. When that balance is disturbed by over-activity of any of these fibres, the subsidiary Prāna *i. e.* the reflex centre, is over-stimulated to generate an impulse which carries information to the highest centre in the brain.

Location and function of the Pancha-Prānas.

It has now been proved that the highest centres are located in the cortex of the brain, where knowledge of action and sensation is manifested. These centres are both receiving *i. e.* sensory, and directing *i. e.* motor, and have their subsidiary centres in the two large swellings called the basal-ganglia in each hemisphere of the brain. They are known as the thalamus and the corpus-striatum. The first is auxiliary to the chief sensory centre and the second to the

chief motor centre in the cortex of the brain. Normally, the auxiliary motor centres are more or less under the control of the will, and importance is not attached to them in the Yogic literature. The Yogi is concerned with the subsidiary nerve centres in the thalamus. The normal function of the thalamus is to receive sensations from all parts of the body, which are relayed to it through the spinal cord, before they reach the chief centre.

Location of Udāna.

As this is the highest reflex centre in the brain and as all impressions ascend to it, it is called the Udāna-prāna. The last relay in the cord, from which it receives impulses, is from that portion of the cord, called the Bulb, which is on a level with the root of the nose. Udāna-Prāna is, therefore, said to rule the portion of the head above this point.

The Yogi, by a conscious control over the Udāna-prāna, suppresses all incoming and outgoing sensations in it, which is necessary to prevent that distraction of the mind which he is anxious to control. By concentration (Samyama) on this Prāna, the Yogi becomes light in weight and can walk on water, through marshes, and over thorns, and can will his own death at any moment.

Location of Prāna.

Prāna (subsidiary) is the next reflex centre in the cord. Its normal function is to receive all afferent impulses from within and without the body, and to control unconsciously the activity of the sympathetic fibres. It is situated in the medulla-oblongata and governs

the respiratory and circulatory functions. The last relay in the spinal cord from which it receives impulses is situated on a level with the apex of the heart. It is therefore said to rule the region of the body between the mouth and the heart.

Location of Samāna.

Samāna-prāna is the third auxiliary centre in the body and is said to preside over the portion of the body between the heart and the navel. It inhibits the excessive activity of the digestive tract.

Location of Apāna.

Apāna-prāna, the fourth reflex centre, rules the region of the body below the level of the navel. Normally, it sends efferent impulses to the excretory and ejaculatory mechanisms in the body, as occasion arises. These impulses from Apāna-prāna cause relaxation of the sphincters of the anus and bladder, as well as contraction of the muscular portion above them, these actions being necessary for the expulsion of their contents.

Location of Vyāna.

Vyāna-prāna is said to pervade the whole body. Its function is to keep the whole body stationary and this stationary condition is due to the balancing of action of the various antagonistic muscles in the body through the unconscious reflexes that are generated along the whole of the spinal cord.

Five other Prānas.

It must not be supposed that these are the only Prānas *i. e.* reflex centres, that were known to the ancient Yogis. They have mentioned five more naming them the Upa-Prānas. These are Nāga, Kurma, Krikkara, Devadatta and Dhananjaya, and the stimulation of these centres cause, respectively, belching, hiccupping, yawning, hunger, and drooping of the eye-lids before sleep. These are all reflex actions, according to our knowledge of physiology.

The Shaktis.

As I am on the subject of reflex centres, I should like to say a few words about the Shaktis that are said to preside over the six important plexuses *i. e.* Chakras, of the sympathetic portion of the autonomic nervous system. Every Chakra is said to have its subsidiary Shakti in addition to the general Shakti—Kundalini—which rules all the Chakras. I will state what these Shaktis are and try to locate them according to our present knowledge of Western anatomy.

As said before, the Shakti of a Chakra is the efferent impulse generated, through a subsidiary nerve centre in the spinal cord, in order to control unconsciously the activity of the organs excited by the fibres of the sympathetic plexuses.

Dākini and Rākini Shaktis.

The Mulādhāra-chakra (the pelvic plexus) and the Swādhisthāna-chakra (the hypogastric plexus) have 'Dākini' and 'Rākini' respectively as their controlling Shaktis. These Shaktis are the efferent impulses generated through the subsidiary nerve centres in the lumbar region (Apānā-prāna) along the fibres of the pelvic nerve, otherwise called nervi-erigens. This nerve is

chiefly concerned with the stimulation of the external organs of generation (whence its name " nervi erigens "). It also sends out fibres to the musculature of the colon, rectum and bladder.

Lākhini Shakti.

Manipura-chakra (the plexus of cœliac-axis) is ruled by the Shakti ' Lākhini '. She is said to be four-armed. This Shakti is the efferent impulse generated along the three or four splanchnic nerves through the auxiliary centres in the thoracic-lumbar region of the spinal cord (Samāna-prāna). These nerves send inhibitory fibres to the stomach and the intestine and also the secretory and sensory fibres to the abdominal organs.

Kākini Shakti.

The Shakti presiding over the Anāhata-chakra is 'Kākini'. This Shakti is the efferent impulse generated along the fibres of the thoracic-spinal nerves through a subsidiary centre in the upper thoracic region of the spinal cord. These fibres control the heart, the lungs and the aorta. The main nerve regulating the functions of the heart, the lungs, and the aorta is the vagus, whose centre is in the medulla-oblongata, but it has been now proved that, even if both the vagi are cut, so as to do away with the controlling influence on these organs, still after preliminary excitation, the action of these nerves is inhibited; showing thereby the possibility of another nerve centre in the spinal cord just below the medulla (Prāna–reflex).

Vishuddhi-chakra is presided over by the Shakti 'Shākini.' This is the efferent impulse generated by the cervical nerves and also by the branches of the Vagus through the nerve centre in the medulla; both the above Shaktis are located in the region of Prāna proper. This Shakti is said to reside in the region of the moon, which I take to be the portion of the medulla-oblongata surrounding the ventricular cavity. It is also said that the nectar *i. e.* the cerebro-spinal fluid, is constantly dropping on the head of this Shakti and that she is seated on the bone, *i. e.* on the superior surface of the base of the skull.

Shākini Shakti.

The last Chakra, Ajnā, is controlled by the Shakti 'Hakini' *i. e.* the efferent impulse generated along the fibres of the oculo-motor nerve through a centre in the thalamus. This Shakti is said to reside in the marrow (majjastha) of the brain. Elsewhere, it is said to reside in the Chakra (Chakrastha) *i. e.* Brahma-chakra which we know to be the cerebrum. It is said to be white in colour. So is the thalamus, the sensory basal ganglia in the brain.

Hakini Shakti.

Every one of these Pancha-prānas is governed by Vāyus which, too, are five in number. These are named in the same way as the five Prānas, being called Prāna, Apāna, Udāna, Vyāna, and Samāna. The word Vāyu in the Yogic literature is used to denote a current or an impulse which is a property of the nerve. All these Vāyus are, therefore,

The five Vāyus.

simply nerve impulses, either generated or received by Prāna from its different locations in the body. These locations of Prāna correspond with the different plexuses of the sympathetic portion of the autonomic system and each lotus *i. e.* plexus, forms an independent nerve centre which can receive and generate a nerve impulse.

Their function.

In the process of Prānāyāma Prāna-vāyu is said to be generated with the intaking of the breath. It is an impulse going to the brain or nerve centres located in the body and is, therefore, an afferent impulse, as we know it.

Apāna-vāyu is generated by the exhaling process of Prānāyāma and is an impulse which travels away from the brain or nerve centres. It is, therefore, an efferent impulse. At the junction of the afferent (Prāna) and the efferent (Apāna) impulses is said to be located Vyāna-vāyu. The function of Vyāna–vāyu is to transfer the Prāna impulse to the Apāna impulse. From this description of Vyāna-vāyu, it appears to be a reflex impulse, which is started either by the brain, the spinal cord, or the nerve centres in the form of the plexus of the sympathetic. When this reflex impulse starts from the brain, the energy of the Prāna impulse is transferred through the Apāna impulse to the skeletal muscles of the body, and the movement is manifested or is made apparent by conscious sensation; but when this reflex impulse starts from the plexuses of the sympathetic, it controls the accelerating effect produced by the Prāna and Apāna impulses in the organs supplied

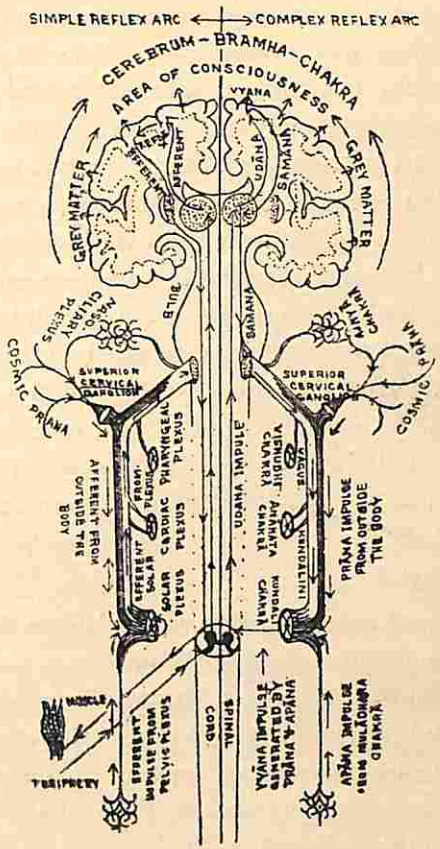


DIAGRAM SHOWING SIMPLE (UNCONSCIOUS) AND COMPLEX (CONSCIOUS) AFFERENT AND EFFERENT CHANNELS OF THE AUTONOMIC NERVOUS SYSTEM.

by that particular plexus without producing any conscious sensation. When this unconscious act is to be made conscious, the acceleratory action of the organ is made to send a Vyāna (reflex) impluse to the spinal cord (Sushumnā-nādi) which is said to ascend the posterior part of the Brahma-randhra-chakra where the thalamus is situated, and finally it reaches the cortex of the brain where consciousness is manifested. This ascending acceleratory impulse is called Udāna. When the Udāna impulse reaches the cortex, it stimulates it, to start a controlling or inhibitory impulse back to the excited organs which started the Vyāna impulse. This is an efferent impulse from the cortex of the brain and, as it equipoises or controls the excited organ, is called Samāna. This impulse is made to pass through the vagus and other nerves of the para-sympathetic portion which have their nuclei in the mid-brain and the bulb.

This type of complex reflex arc emphasizes the fact that although the function of many of the organs innervated by the autonomic nervous system is, in a large degree, autonomous there is still a dependence upon and a close relationship with the central nervous system. Knowledge of this fact made the ancient writers on Yoga attach paramount importance to the Sushumnā-nādi.

These Pancha-prānas and the currents generated by them are not normally under the control of the will, and to establish such a control is one of the most important achievements in the Science of Yoga. These Prānas, as said before, are the different controlling energies of the plexuses of the sympathe-

tic, but there is a Shakti that controls singly the activities of these plexuses; and that Shakti is the Vagus nerve *i. e.* Kundalini. By establishing control of the will over this Kundalini, we can subjugate not only the Pancha-prānas but the whole of the autonomic nervous system and thus suspend the katabolic activity of the body which disturbs the mind.

Bandha and Mudrā.

This current of Kundalini is brought under control by practising certain catches (Bandha) and by attitudes of the body called Mudrā during the process of Prānāyāma.

Making Kundalini impressionable.

How the rhythmic action of Prānāyāma stimulates the vagal centre in the medulla is already explained while mentioning the process of Prānāyāma. During the Kumbhaka stage (breath retention) of Prānāyāma, when the inhaling of outside energy with the oxygen is stopped and the exhaling of carbonic acid gas is prevented, the venosity of the blood is increased and this increased venosity of the blood has a powerful effect in stimulating the origin of the Kundalini (the Vagal-centre in the medulla) to action. The longer the breath is retained the more powerful is the effect on the Kundalini. By this process the current generated proceeds through the whole length of Kundalini till it arborises in Manipura-chakra, which is indirectly connected with the Swādhishthāna (hypogastric) and Mulādhāra (pelvic) chakras.

The directing of the gaze at the root or tip of the nose in the process of Prānāyāma has the effect of stimulating the

afferent sympathetic fibres of the Kundalini. The convergence of the eye balls to a near point in the body stretches the lateral rectus muscle of the eye-ball, which in turn stimulates the ciliary ganglion which is in close connection with it in the orbit. The current generated by this stimulus is carried along the various fibres of the sympathetic to the afferent fibres of Kundalini through the superior cervical ganglion of the sympathetic chain. This afferent impulse passing through Kundalini, stimulates the fibres of the solar plexus and of the plexuses situated further down.

Distinction between Asana and Mudrā.

The exercises of Prānāyāma with the gaze fixed on the tip or root of the nose stimulate and make impressionable the afferent fibres of the Kundalini *i. e.* the vagus nerve, throughout its whole length, but this is not what the Yogi is anxious to achieve. He wants the current of the Kundalini to stop at a desired Chakra to inhibit the function of that particular Chakra; and this is done by practising certain Bandhas (catches) during the process of Prānāyāma and also by certain attitudes of the body called "Mudrā." These attitudes of the body must not be confounded with "postures" of the body (Asana). Though Mudrā is a variety of Asana, it differs from it in having a certain definite contortion of the portion of body above the neck while in Asana that contortion is restricted to the portion below the waist. There are three important Bandhas and a good many Mudrās which a student of Yoga is advised to practise, with the help of a Guru, to rouse the sleeping

Kundalini. The various Asanas, Bandhas or Mudrās are said to deliver the body from the ravages of idleness and old age, and thus to retard death. They keep the body active and supple, and also prevent the distraction of the mind, over which a Yogi wants to establish control. They also preserve him from injury, fire, and water. It is in this that the superiority of Kundali Yoga over Jnāna Yoga lies. A Hatha-Yogi, in whose achievements the Kundali plays an important part, perhaps knows the doctrine "Mens sana in corpore sano," for by these physical exercises, he tempers his body to the condition of steel, and establishes a perfect control over it. He really becomes master of his body, and can will his own death at any moment. He is called "Ichchhā-marani." Thus a Hatha-Yogi can enjoy all physical happiness within the restrictions given in the eight rules of Yoga, and, if he be perfect in his art, he can control the mind and seek liberation from further existence and become absorbed into Brahma which is all pervading. A Jnāna Yogi, on the other hand, perhaps by superiority of of his evolutionary advancement, establishes from the very start a perfect control over his mind by intellectual processes, regardless and unmindful of his physical body and the ravages of diseases and ill health. Physical worries do not distract his mind from the object of his achievement. He may be lean, weak, prone to disease, and yet he is a Yogi. In fact though he lives in his body, yet he is out of it. His mind is always in the contemplation of the self and seeking its liberation, while his body is undergoing the effects of his

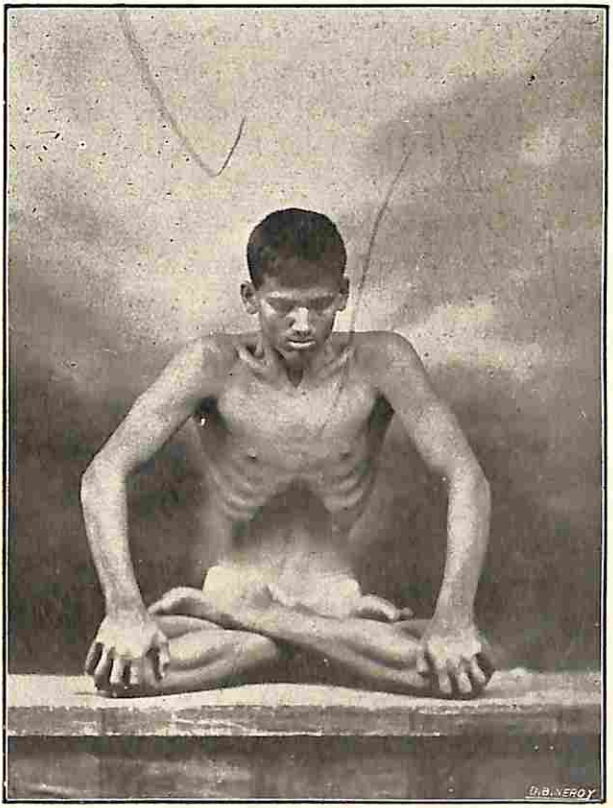
Superiority of Hatha Yoga over Jnāna Yoga.

desires entertained in past lives. He is thus known as Jivan-mukta. In a Jnāna Yogi, Kundalini is not necessarily active.

The three Bandhas and their practice.

The three important Bandhas (catches) named above are Mula-bandha, Jālandhara-bandha and Uddyāna-bandha; and they are all to be practised in one rhythm of Prānāyāma. Mula-bandha is to be practised at the beginning of the process of Prānāyāma. In this Bandha, the centre of the perineum (Yoni) is firmly pressed, by the heel of the right foot as in Siddhāsana and, when this is neatly done, the whole body appears to rest on that heel; the left leg then rests easily on the right thigh; with the Puraka of Prānāyāma *i.e*, with deep and prolonged inhalation, the anus becomes contracted and drawn upwards, the hands automatically rest on the knees, shoulders appear elevated, and the head and the neck appear depressed between them (see plate III). When, in this attitude of the body, Puraka is completed, Kumbhaka *i. e.* retention of the breath is practised with the head bent forward, and the chin made to press firmly against the root of the neck. This causes submersion of "Kantha-Mani" *i.e.* "popum adami" in the cavity thus caused. This attitude of the body is the Jālandhara-bandha. After this, the Rechaka process of Prānāyāma is gone into, and here the breath is exhaled, the navel drawn upwards, with expansion of the lower part of the thorax, till the abdomen is completely flattened. This is called Uddyāna-bandha and with these three Bandhas a complete rhythm of Prānāyāma ensues.

Plate III.



Uddiyana-bandha with condition of the neck preliminary to Jālandhara bandha.
(Vide page 68)

Their effects on the autonomic nerves.

The effect of these Bandhas on the nervous mechanism of the autonomic system is interesting to follow. In Mula-bandha the pressure of the heel on the centre of the perineum from below upwards and the pressure of the body, which is made to rest on the heel, from above downwards, stimulates the pelvic plexus (Mulādhāra-chakra) to action; at the same time, it blocks the downward and outgoing (efferent) impulses from it, but the upward efferent impulses being unchecked, ascend through the connecting fibres to the Swādhisthāna-chakra *i.e.* the hypogastric plexus, and thence through it to the Manipura-chakra *i.e.* the solar plexus.

On structure of the body.

These plexuses being thus stimulated, there occurs an inhibition of functions of the organs supplied by the sympathetic fibres from these plexuses. The peristaltic action of the gastro-intestinal tract being inhibited by stimulation of the sympathetic fibres, gases accumulate and inflate it with consequent discomfiture; also, owing to the contraction of the blood vessels of the splanchnic area, there is diminution of blood supply to the abdominal viscera, which checks the secretion of the gastro-intestinal tract. Consequent upon this disturbance of the katabolic activity of the sympathetic system, there occurs a general circulatory and respiratory disturbance: the heart beats faster, the blood vessels going to the muscles dilate, and the cutaneous blood vessels contract. Respiratory activity is increased, the breathing becomes faster and a feverish sensation is produced in the

body. All this activity of the sympathetic is described in weird and exaggerated language in the old Yogic literature (see Jnāneshwari Chap. VI), yet, in the main, it is true and accurate.

Katabolic disturbance unconsciously controlled.

This katabolic disturbance in the body causes a fear of illness in the mind of an initiate and makes him leave off the practice of Prānāyāma with Bandha, but if persisted in, this overstimulation of the sympathetic fibres automatically excites the fibres of the Kundalini in the Manipura-chakra (*i.e.* solar plexus) where she is said to be lying dormant. The afferent (Prāna) impulse, which is generated from the Kundali-chakra tries to travel upwards to its abode in the medulla, *i.e.* to the vagal centre, stimulation of which brings under control the activity of the sympathetic quite unconsciously. This unconscious activity of the Kundalini is not what is desired. A Yogi desires to become conscious of the work of Kundalini and that is only possible if stimulation of the vagal centre is done through the posterior part of the spinal column (Sushumnā-nādi), the nerve of knowledge and consumer of time. Jālandhara-bandha, by its particular bend in the neck, prevents this afferent impulse generated from the Kundali-chakra from reaching the vagal centre and, at the same time, it directs downwards the afferent impulses, generated by the inhalation of breath, along the sympathetic fibres in the vagal nerves. This afferent impulse (Prāna-vāyu, from outside meets the efferent impulse (Apāna-vāyu) generat-

Sushumnā necessary for conscious control.

ed by the Mulādhāra-chakra in the region of the navel. When these Prāna and Apāna impulses meet together, the meeting is manifested by internal vibrations *i. e.* sounds which are heard by a Yogi and are known as "Nāda" or "Shabda-Brahma". These two impulses together stimulate the endings of the vagi in the Manipura-chakra generating a reflex impulse (Vyāna-vāyu), that in its turn produces an ascending impulse (Udāna-vāyu) which goes through the posterior portion of the spinal cord (Sushumnā-nādi) by exhalation of breath during Uddyāna-bandha. This Bandha (catch) prevents the Udāna-impulse from descending. The Udāna impulse, therefore, rises atom by atom *i.e.* by relays, to the cortex of the brain and transmits to the vagal centres the impressions made on its nerve endings, and the mind, through the medium of Brahma-randhra-chakra (the brain), becomes conscious of its function.

Nāda produced by meeting of Prāna and Apāna.

By the constant practice of Prānāyāma with these three Bandhas mentioned above, a Yogi establishes a conscious control over Kundalini which is then easily acted upon by the will. This conscious control may not last long. The Kundalini tries to resist this interference by the will and begins to move in and out of her abode in the medulla *i.e.* begins to send and receive efferent and afferent impulses. This is what in Western physiology is called the 'vagus escape.' The

Bandha & Prānāyāma establish conscious control over Kundalini.

recurrence of a few beats of the radial pulse during its stoppage-period of three minutes, when Deshbandhu performed this feat, may be thus explained. A Yogi's effort is not only to get conscious control over this Kundalini, but to keep her steady and inactive in her abode in the mid-brain, so that she may remain impervious to the afferent and efferent impulses which have the power of influencing the mind-stuff which is "Chitta" in the language of the Yoga-manual. Kundalini is thus submerged in Chitta. The submersion of Prāna in the mind is "Samādhi" *i. e.* super-consciousness, and does not prevent a Yogi from the worries of successive rebirths; but the submersion of Kundalini, which is said to be the cord of desire, in Chitta, which is a further process of Samādhi, does obtain for a Yogi the desire of his life *viz.* liberation from rebirths. This is known as Nirvikalpa Samādhi, wherein a Yogi is one with that Cosmic Power which creates and sustains the universe.

There are a good many Mudrās for rousing Kundalini and the easiest of these Mudrās, the one to be practised first, is the "Shaktichālan Mudrā." The pose of Siddhāsana having been assumed both the legs are caught hold of by the hand and made to press firmly on the perineum where Mulādhāra-chakra is situated; then as a next-step, with powerful in and out breaths

Shakti-Chālan Mudrā.

the muscles of the abdomen are made to contract and relax, with corresponding contraction and expansion of the anus. Contraction of the anus stimulates the Apāna impulse to ascend and meet the Manipura-chakra *i. e.* Solar plexus, around which the efferent fibres of Kundalini arborise. The contraction of the abdominal muscles, which press the contents of the abdomen against that plexus, prevent the Apāna impulse from travelling upwards. Inhalation generates the Prāna-impulse which meets the Apāna-impulse at the Manipura-chakra. The meeting of Prāna and Apāna impulses is the first preliminary for consciously exciting Kundalini, which starts successive impulses of Vyāna *i.e.* reflex action: Udāna *i.e.* the ascending, and Samāna *i.e.* the equipoising, and their mode of action is the same as mentioned in the working of the various Bandhās. In this Mudrā, as in the Bandhas, the fibres of Kundalini are excited at their terminations.

Meeting of Prāna and Apāna Vāyus essential for conscious stimulation of Kundalini.

The next Mudrā to be practised is the Yoni or Shanmukhi Mudrā. In this Mudrā, all external impressions, which are carried by the nine openings in the body to the brain, are stopped by the fingers and heels. These nine openings are the two each of the eyes, ears, and nose, and one each of the mouth, urethra, and anus. It is impossible to breathe when the nose and the mouth are closed. It is, therefore, advised

Shanmukhi Mudrā ; its importance.

that the opening of the mouth should be only partially closed by protruding the lips forward like the beak of a crow.

The Prānāyāma process is then followed by meditating on the six Chakras from the lowest upwards. In this Mudrā, all external impulses of sight, sound and smell, being stopped the nerve centres in connection with these remain inactive and with the in-take of Prāna through the opening of the mouth, an afferent impulse through the gustatory nerves only, is carried to the vagal centre—that is to the abode of Kundalini—in an upward direction. This stimulates the centre to produce an Apāna impulse which descends down for a very short distance and is immediately met by Prāna *i.e.* the afferent impulse, the meeting of the two impulses again stimulating the vagal centre reflexly through the spinal cord. In this Mudrā the vagus nerve is stimulated at its very centre.

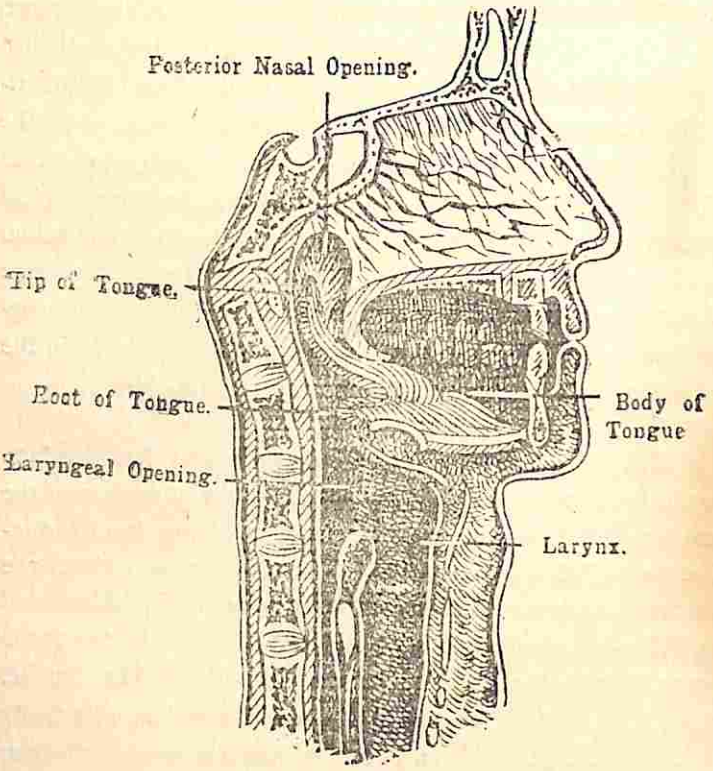
Khechari Mudrā; its importance and effects.

After complete mastery of Shakti-chālana and Yoni-mudrā the practice of Khechari-mudrā is undertaken. In this Mudrā the tongue is rolled backwards and upwards, during the process of inspiration, behind the soft palate so as to reach the base of the skull behind the posterior nasal openings. The gaze is fixed on the root of the nose. This position of the tongue in the mouth is said to prevent the flow of current along the Idā, Pingalā, Sushumnā, Hasta-jivhā, and Gāndhāri

Nādis *i.e.* along the fibres of the sympathetic in the tongue, the eyes, and the sympathetic chains, to the spinal cord. The Khechari-mudrā is said to be the king amongst the Mudrās and yet, as with the other Mudrās and Bandhas, the physiological importance of this Mudrā too is not mentioned. The actual modus operandi is difficult to gauge from the very meagre description at our disposal, and it would be even risky to suggest one. I shall, however, make an effort to explain the physiological and anatomical importance of this Mudrā.

Khechari—King amongst the Mudrās

The rolling of the tongue upwards and backwards to reach the base of the skull, carries the superior surface of the tongue with its end-organs of sensations, away from the influence of Prāna from outside. These end-organs, which are situated on the terminations of the nerves, not being stimulated by Prāna-impulse fail to carry afferent impulses to the vagus nerve through the superior cervical ganglion. The tongue, when it is made to assume this desired position, effectively blocks up the posterior nares and prevents expiration through the nose; furthermore the rolling back of the tongue in the direction mentioned, draws the root of the tongue forward towards the teeth; concomittant with this forward action, the opening of the larynx, through which the air goes to and from the lungs, is carried underneath the base of the tongue and there the closure of the glottis is secured through a contraction of its own muscles by a stimulus going to them from the laryngeal branches of the Vagus, which supply the larynx.



SAGITTAL SECTION OF THE FACE SHOWING THE POSITION OF THE TONGUE IN KHECHARI MUDRA.

and the base of the tongue. Though the rolling up of the tongue prevents the stimulation of the vagal centre through the afferent fibres from the buccal cavity and lungs yet it stimulates it directly through its own afferent fibres. This closure of the larynx is again helpful in preventing the expiration of the air from the lungs. Besides, this particular pose of the tongue lifts up the lower jaw towards the upper and tends to keep the mouth closed. This little device of the tongue during the process of inspiration practically blocks up all the expiratory channels, producing a condition of vacuum in the buccal cavity, and at the same time, keeps the lungs inflated with the pure air necessary for the oxygenation of the venous blood of the body, which is propelled into the lungs from the right side of the heart. The inflated condition of the lungs (positive ventilation) sends an afferent stimulus to the vagal centre which, in turn, sends an efferent expiratory stimulus to the lung, and an efferent inhibitory stimulus to the heart. The expiratory stimulus to the lungs proves abortive owing to the closing of the expiratory channels by the tongue, but the inhibitory stimulus to the heart causes the heart to contract powerfully. This contraction of the heart drives out all the oxygenated blood, gathered into the left side of the heart during the process of inspiration, into the arteries for the nourishment of the tissues of the body. It is known that, during each inspiratory period there occurs in every individual, a moment, when the oxygen-content of the

Effects of Khechari-Mudrā on the circulation of the blood.

blood, both in the tissues and blood vessels, is at its highest. If this moment is artificially prolonged, as was seen under X-rays when Deshbandhu made the beats of his heart inaudible, no blood enters the heart and there being nothing in the heart to expel, arterial and pulmonary circulation comes to a standstill. This stationary condition, equalises the oxygen pressure in the minute arteries and in the tissue, prevents an interchange of material between them, and keeps the whole body perfused with suitable material necessary to keep up its vitality, though all the functions of the body are practically at rest. The heart too remains perfused with a suitable medium and though empty and contracted, preserves its inherent power of contraction etc., in a latent form. This is the condition taken advantage of by a Yogi practising Khechari-mudrā; he tries to keep the Prāna, *i. e.* energy absorbed, bottled up, without contamination, in the body by blocking the opening of the lungs with the rolled up tongue, so that he can liberate this energy for action at his own sweet will. To all outward appearance a Yogi practising this Mudrā, appears to be dead, and in this condition he can remain as long as he likes either buried under the earth or above it.

It helps to keep Prānā bottled up in body.

It is not possible to practise this Mudrā, unless the tongue is exceptionally long. To roll the tongue so as to act as a block, it must be long enough to reach the root of the nose between the eyebrows. For this lengthening of the tongue certain processes are advised, viz.

Elongation of the tongue ; a prime factor.

A Method of Elongation.

(a) "Chhedana" *i. e*, the cutting gradually at intervals of the band which holds the tongue to the base of the mouth; (b) "Chālan" this tie being removed, the tongue is then moved from side to side by holding it between the fingers; (c) "Dohana" pulling forward in a manner similar to the milking of a cow.

The moment for rolling back the tongue.

No mention is made in Yogic literature of the moment in the process of Prānāyāma when the tongue is to be rolled upwards and backwards. Though the movements of the tongue are voluntary and it could be rolled backwards at any moment by practice, yet the rolling movement is greatly facilitated by the process of swallowing, when there occurs for a time a suspension of breath. This suspension may occur at the end of either inhalation or exhalation. The Yogi practising Khechari-mudrā has to choose either of these moments. If the rolling be done at the end of exhalation there is not enough oxygen in the body to vitalise the tissues. The Yogi's aim, however is to absorb enough energy from outside and to retain it in the body, and this is effectively done by making the tongue assume the required position during the process of inhalation.

Importance of Mudrās.

The practice of Mudrā, then, in Yogic science is designed to establish by constant effect a conscious control over Kundalini *i. e.* the Vagus nerve, either by stimulating it at its endings or at its centre.

Samyama for willing Kundalini to action.

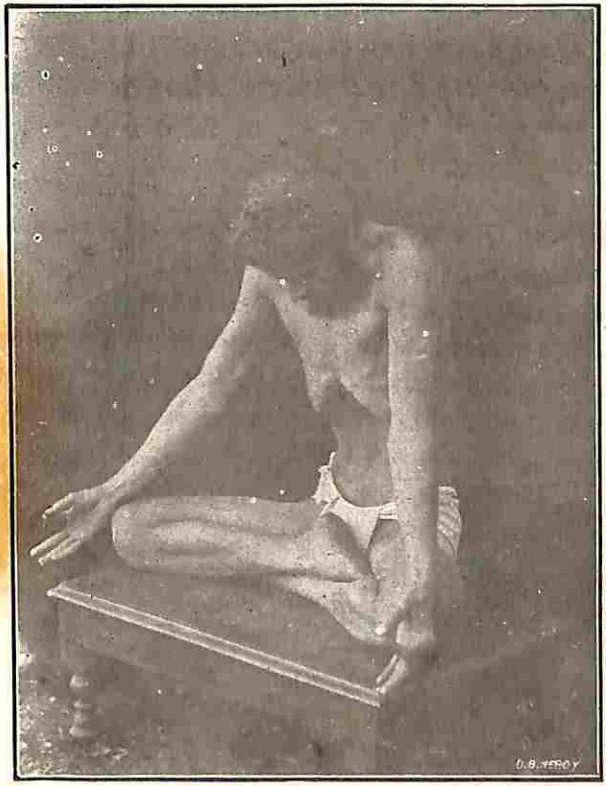
After establishing a conscious control over this Kundalini by the process of Prānāyāma with Asana, Bandha and Mudrā, there arises the necessity of willing it to action, and this is done by Samyama, which includes Dhāranā, Dhyāna and Samādhi. I have already explained the meaning of these terms.

Concentration (Dhāranā) is fixed upon the nerve to be worked upon to the exclusion of all others. This generates in the nerve an afferent impulse (Prān-vāyu) which is attracted by the Chakra or the object that you wish to influence or achieve by meditation (Dhyāna). And, by continuous meditation on the object of your desire, an efferent impulse is generated which is carried upwards to the brain through the Nādi of Knowledge, the Sushumnā (spinal cord), where the manifestation of your desire is made known. The knower in you thus made conscious by the constant impressions of your desire, tries to fulfill them when the state of super-consciousness *i. e.* Samādhi is reached ; and it is in this state that everything mental, moral and spiritual can be achieved. Here concentration acts as a will force, meditation as a thought force and Samādhi as a soul force.

Normally, we are not able to differentiate between these three acts, as they occur in quick succession, and only the result is made known to us.

By this process of Samyama, Kundalini can be made to act on or pierce through the six important Chakras of the

Plate IV.



Pose showing the three Bandhas. Mula-bnadha, Uddiyana-bandha and Jālandhara-bandha.
(Vide page 68)

body, and this passage of Kundalini through the chakras is known in the Yogic literature as Shat-chakra-bheda.

Nirvikalpa Samādhi.

When a Yogi becomes a perfect adept in the control of Kundalini, the soul is made free from the shackles of Chitta, Vāsanā and Prāna; it is then free to move out from the Brahma-randhra, in which it was kept in captivity, and occupies a bigger cavity surrounding the brain and the spinal cord, known as Akāsha, and becomes absorbed in the Infinite Intelligence from which it emanated. The Yogi, when in this state of Nirvikalpa-samādhi, identifies himself with that which he contemplates, and acquires certain supernatural powers. These are eight in number and are known in Yogic literature as Ashta-siddhis. They are acquired by the particular mode in which the Yogi concentrates and merges himself in the Divine Spirit (the Cosmic Power) or contemplates it within his own self. The following are the names of the Siddhis and the effects that they produce.

Astha Siddhis.

Animā or the microcosm.

(1) Animā or the microcosm is a specific property of minuteness of the soul. A Yogi, concentrating, meditating and fixing (Samyama) his attention on this quality of the soul during a forced exhalation draws together his entire energy to a point, which is then made to penetrate into all bodies so as to make them vibrate according to the will of the Yogi. A Yogi at first tries this Siddhi

on inanimate things and when he becomes a perfect master, he gains another Siddhi of entering into dead bodies and bringing them to life again. This Siddhi is called Prakāmya or overgain.

Mahimā or the macrocosm.

(2) Mahimā or the macrocosm is also a special quality of the soul. It fills the body and extends through all space and becomes enclosed within itself. By concentrating on this property of the soul, a Yogi, by mere inhalation of air, makes his body assume a large size and comprehends the universe in himself as was done by Krishna when he assumed the Virātswarupa to show to Arjuna how the whole of the universe was within him.

Laghimā or lightness.

(3) Laghimā or lightness is the third property of the soul. By making Samyama on this property of the soul, the Yogi produces a diminution of his specific gravity by successive Puraka Prānāyāma *i. e.* by swallowing large draughts of air. He can thus make his body as light as a feather so that it can float in the air or in water. The Yogi's power of travelling thousands of miles in a moment is attributed to this Siddhi or perfection.

Garimā or gravity.

(4) Garimā or gravity is the fourth property of the soul *i. e.* of increasing the specific gravity of the body and thus making it as heavy as a mountain by swallowing large draughts of air and compressing them in the tissues of the body. Krishna is said to have

assumed this heaviness of body (Vishvambhara-murti) and thus preponderated over all weights in the opposite scale when he subdued the pride of his wife Satyabhāmā.

Prāpti or success.

(5) Prāpti or success is the obtaining of desired objects and supernatural powers. The Yogi, when he is in Samādhi, acquires the power of predicting future events, of understanding unknown languages, of curing diseases, and of divining the unexpressed thoughts of others. He also becomes clairvoyant and clairaudient. All the miracles of saints and saviours of all climes and times are due to this perfection. Do we not read in the first few lines of the Bhagavad-Gitā about Sanjaya giving a description of the battle waged at Kurukshetra to the blind king Dhritarāstra, even while staying with him in latter's palace?

Prakāmya or overgain.

(6) Prakāmya or overgain is obtaining more than one's expectations and consists in the power of casting off the old skin and maintaining a youthful appearance for an unusual period of time, as is recorded of the Yogi-King Yayāti, and Alcibiades, who maintained an unfading youth to the last day of their lives. By some writers it is defined to be the property of entering into the body of another person (vide Animā).

(7) Vasitvam, or subjection, is the power of taming living creatures and bringing them under control. It is defined to be the restraint of the passions and the emotions and likewise, the bringing of men, women and the elements under subjection.

Vasitvam or Subjection.

(8) Ishatvam or dominion is the obtaining of universal dominion either in this life or the next, by means of Yoga. It is also said to be the attainment of divine power, when the Yogi finds himself in a blaze of Light.

Ishatvam or Dominion.

Thus, when the Yogi, through his soul, tries to unify himself with the soul of the universe, he can make himself lighter than the lightest substance, and heavier than the heaviest, can become as vast or as minute as he pleases, can traverse all space, can animate any dead body by transferring his spirit into it. He can render himself invisible, can obtain all objects, become equally acquainted with the past, present and future, and he can be finally united with God, and consequently exempted from being born again upon this earth.

The explanation of these Ashta-siddhis is beyond the scope of the physiology of the physical body. A Yogi cannot do or achieve these through the nerve current in his body, but when the Yogi has freed himself from nerve currents, he will be able to achieve the Ashta-siddhis by other channels. The channel

Probable explanation of Siddhis.

through which these siddhis are worked is the Akāsha material of the body. Surrounding this physical body of ours there is said to exist a body, which is an exact counterpart of our physical body, a counterpart composed of an ethereal substance of a very high rate of vibrations. It is neither mere matter nor yet is mere force. It is composed of very fine matter but far more tenacious than anything that is known as matter. This Akāsha material of the body, in the Science of Theosophy, is descriptive of the super-sensible substance supposed to pervade all space and enter into all bodies ; and it is the body that is formed out of this substance which is called the Astral body.

The Yogi, when in Samādhi, consciously liberates his soul from the Brahma-randhra, which now begins to function through his Astral body, even at points in space far removed from his physical body ; when this object is gained, the Yogi withdraws his soul from the Astral body to the physical body along a fine filament of ethereal substance which connects these two bodies together. If this filament is torn by accident, the soul in the Astral body is unable to return to the physical body, and the body dies.

In these perfections or Siddhis, Kundalini does not take any part directly but it does prepare the ground for the soul to vibrate through another channel than the nerves.

The ultimate aim of the Yogi, in these various practices, is not to acquire and manifest various supernatural powers, which indeed only come to him on his course of becoming absorbed in the Infinite—" He is then no longer that finite

being, having a consciousness of his own separate existence, but he is lost in and becomes one with the Infinite. "

The various practices of Yoga appear simple and easy of achievement on paper ; yet they are only to be learnt at the feet of a master. " Looking to the gravity of the subject and practices which have a close relation with the vital organs of the body, it is of paramount importance that the instructions should be received by a student from an adept. All men are not equally fitted to receive instruction ; man inherits at birth his mental and physical capital according to his actions in previous births and has to increase them by manipulation, but, even among such, there are different grades. Hence one cannot become a Yogi in one incarnation. "

If this be true, the question arises, whether all those persons, who exhibit supernatural powers to the world to earn a living, have gone through the manifold stages of Yogic practice. The answer to this question may very well be given in the words of Swāmi Vivekānandā when he says that " whenever there is any manifestation of what is ordinarily called supernatural power or wisdom, there must have been a little (control over the) current of Kundalini which found its way into the Sushumnā. Only, in the vast majority of such cases of supernaturalism, they ignorantly stumbled on some practice which set free, (and made them conscious of) a minute portion (of the control) of the coiled up Kundalini. "

From all I have said, it may be gathered that the physical practices of Kundali-Yoga are for the developmen

of control over the autonomic nervous system over which we have normally no control. The six Chakras in the Yogic literatue, which, when controlled, give wonderful powers to a Yogi, are simply the six important plexuses of the sympathetic portion of the autonomic nervous system; and the Shakti (power) or Kundalini, which pierced these Chakras *i. e.* formed connections with them is, according to my version of it, the vagus nerve in the body. Normally, Kundalini does her usual work unconsciously and is said to be lying dormant within us, and to establish conscious control over this Kundalini is an important step in the achievement of Yoga.

Summary of the book.

By constant practice of Prānāyāma with Asana, Bandha and Mudrā, Kundalini is roused from her sleep and brought under the control of the will. When this Kundalini is roused from her sleep, she forces a passage through the different Chakras and excites them to action, and as she rises step by step, the mind becomes opened and all vision and wonderful powers come to a Yogi when she reaches the brain. The Yogi then becomes perfectly detached from the body and the mind; and the soul finds itself free in every respect.

All the miracles of a Yogi, such as stopping the beats of the heart and pulse etc. can be explained by this conscious control over Kundalini.

Scientific definition of Kundali Yoga.

I would, therefore, define Kundalini Yoga as a science of physical and mental exercises of a particular form by which an individual establishes a conscious control over his autonomic nervous system so as to get in tune with the Infinite.

In conclusion I have to express my thanks to the various authors from whose books I have drawn a great deal. Of these I attach a bibliography.

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